4+ publication

Vickers-Armstrongs Wellington

Medium Bomber variants
Mks.I, IA, IC, II, III, IV, B Mk.X,
T Mk.X/T Mk.10,T Mk.XIX/T Mk.19

world war II wings line

1/72 scale plans

An early production Wellington Mk.IC, P9249, fresh from the Weybridge production line, shows its classic lines during a test flight in the spring of 1940.

Vickers-Armstrongs Wellington Medium Bomber, the history and summary

The bomber! This kind of specialized aeroplane became a true phenomenon in British military thinking since it first dropped its lethal bomb load from the gloomy skies of the Great War. With the recognition of its true potential, a number of bomber designs had evolved by the end of the 1914-18 war, and extensive post-war budget cuts meant that developments remained around these designs for some time after the armistice.

As far as twin-engined night bombers were concerned, during the immediate post-war period the RAF was compelled to rely on her ageing aircraft like the Handley Page O/400, the de Havilland DH.10 Amiens and the Vickers Vimy. Despite the difficult decade that followed, with a reduction in funding and less interest in developing new bomber aeroplanes, several new types did evolve. They were sometimes of an unwieldy appearance and had limited operational use, but they represented a considerable advance in design and were later to be used as the basis for some major aircraft types. The principal suppliers of the heavier class of bombers became Handley Page, Vickers and Boulton & Paul, represented by their Hyderabad/Hinaidi, Virginia/Victoria and Sidestrand/Overstrand aeroplanes, respectively. The era of heavy bomber biplanes was crowned by the Handley Page Heyford, which also incorporated a retractable ventral gun turret, thus improving the defence against attacking fighters, and by the arrival, in 1936, of the Fairey Hendon monoplane. These aircraft heralded the continued development of the British bomber taking place during the first five years of the 1930s, which was to come up with the Bristol Bombay, the H.P. Harrow and the Armstrong Whitworth Whitley. Their bomb loads reached the 2,000lb, 3,000lb and 3,400lb limits respectively, with the Bristol and Armstrong Whitworth types also featuring all-metal stressed-skin construction and the Whitley being the first RAF bomber to be equipped with both the retractable undercarriage and turret armament. Vickers' attempt to replace their Virginia biplane bomber was in vain at the end of the twenties – losing out to Handley with their Heyford, and to Fairey's Hendon – but their effort was put to good use as they had accumulated substantial experience in metal construction. A newly-developed metal structure by B.N. Wallis, the father of the famous R.100 airship, was yet another step forward in the firm's construction methods and was proved by the design of the Wellesley general-purpose and bomber monoplane of 1935.

The Vickers name had appeared on the British aviation scene as early as 1911 when the aviation department of Vickers, Sons and Maxim Ltd. was established. At first associated with the construction and production of rigid airships for the Admiralty, it also received and processed large orders for Government-designed aircraft during WWI, e.g. the BE.2 and 2c, FE.8 and SE.5a. After the war its design office was centred on Weybridge, under the leadership of the able designer R.K. Pierson, and the firm became well-known for its Vimy and Vernon aircraft, Viking amphibians and Virginia bombers. In 1928 a merger with Armstrong Whitworth created a new company called Vickers-Armstrongs Ltd. – at the same time another reputable firm was acquired, the Supermarine Aviation Company, which was to become its subsidiary. Other Vickers designs included the Vildebeest torpedo-bomber and the Vincent general-purpose aeroplane (both built in considerable numbers), the Scout and Venom fighters, and the COW gun fighter, the latter only remaining as prototypes.

In October 1932 Specification B.9/32 was issued by the Air Ministry calling for a twin-engined medium day bomber as a replacement for the Boulton and Paul Sidestrand. Four firms took part in the tender – Handley Page, Vickers, Bristol and Gloster – but only projects from the first two were accepted and put into action. The submitted designs were, as a result of disarmament talks at the League of Nations, initially hampered by tare weight limitations, but with the political climate on the continent rapidly changing, this obstacle was eventually overcome. Thus, studies for alternatives were prepared to reflect these limits, with the Handley Page bid leading to the construction of the rather unorthodox Hampden aeroplane. As for Vickers, several conventional projects emerged between February 1933 and March 1934, which were discussed at Air Ministry design conferences. One draft suggested a high-wing monoplane, with a fixed undercarriage and powered by Mercury VI radials, while another proposed a mid-wing aircraft, with a retractable undercarriage and Rolls-Royce Goshawk I in-line engines. Yet another project was offered, eventually selected for prototype construction as Type 271, which adopted an original, and ingenious as it was to prove, lattice construction technique based on geodetic principles, enabling high strength-to-weight ratios and savings in weight. Although at first confirmed with a pair of Goshawk engines, its definitive powerplant, the Bristol Pegasus, promising considerable improvement in speed and climb, was selected only in August 1934. The prototype, serialled 'K4049', had a bulky cigar-shaped fuselage, with a pronounced "waist" beneath the tailplanes, and accommodated a crew of four. The pilot was seated under the large transparent hood above and forward of the leading edge of a high aspect ratio wing. A total of 4,800 lb of bombs could be carried, contained within the lower fuselage, while gun stations were provided in the nose and tail, covered by spacious transparent cupolas. The aircraft was fitted with twin 915-hp Pegasus X engines turning the de Havilland three-bladed variable-pitch propellers. The tare weight increased to 11,510 lb – twice the original specification – and the gross weight reached 21,000 lb. It was first flown at Brooklands on 15 June 1936, with the company Chief Test Pilot J. Summers at the controls, and was first shown to the public at the RAF Display at Hendon later the same month, with its official name, the Crécy. However, the following September the name was changed to the Wellington, conforming to the policy of giving bomber aircraft the names of towns. At the same time, this also brought to mind the Duke of Wellington, as well as the initial letter 'W' represented the Wallis geodetic construction of Vickers aircraft. Type 271 was successful in its trials, well exceeding the demands of B.9/32, particularly in range (twice the 1,500 miles specified) and bomb load, but the aircraft was lost on 11 April 1937, when it crashed during diving trials at A&AEE at Martlesham Heath.

Wellington Mk.I underwent a complete revision in accordance with the new Specification 29/36, issued in February 1937 to cover the production version. The re-design, Type 285, was parallel to the larger and heavier B.1/35 twin-engine bomber, later called the Warwick, with which it shared fuselage and wing sections. The new Wellington had a deeper fuselage to facilitate bomb stowage, a lengthened nose, long cabin windows and a redesigned rear portion without any waisting beneath the horizontal tail unit. The rounded form of the fin and rudder was replaced by new surfaces of higher aspect ratio, while horizontal tail surfaces were raised. The wing span was slightly increased and the undercarriage fairings were exchanged for doors hinged to the nacelles. A retractable tailwheel was fitted dispensing with its streamlined spat. Vickers design nose and tail turrets were introduced, replacing the manually-operated rotating cupolas of the prototype. Both stations were armed with 0.303" Brownings, with a single gun firing forward and twin guns rearwards. A ventral retractable Nash and Thompson turret was to be added behind the bomb bay, but was not fitted to Mk.I production aircraft. The crew increased from the original four to five members: the pilot, bomb-aimer/front gunner, navigator, radio-operator and rear gunner.

The first contract for 180 Wellingtons, to be built by Vickers at Weybridge, was received in August 1936 as part of the RAF expansion scheme. Further orders followed the next year, with 100 Mk.Is and 100 Mk.IIs (a projected Merlin-engined variant) sub-contracted to Gloster Aircraft, and 84 aircraft to be manufactured by Sir W.G. Armstrong Whitworth Aircraft. These orders were eventually transferred to the newly-built "shadow" factories at Chester and Blackpool; Mk.I aircraft were only built at Weybridge and Chester while the Blackpool factory produced later Mark Wellingtons. The Wellington Mk.I prototype, L4212, first flew just before Christmas 1937, powered by Pegasus X nine-cylinder single-row air-cooled engines turning de Havilland three-bladed propellers, but was re-engined with an improved 815-hp Pegasus XVIII the following April, thus becoming Type 290. Unlike the production aeroplanes it was fitted with mass-balanced elevators and lacked the aerial masts. A new horn-balanced elevator was mounted on the first production Mk.I, L4213, also having the chord of the flaps decreased and elevator tabs interconnected with the flaps. During production provision was made for cockpit heating and wing de-icing, and dual-control conversion was available for a number of aircraft as well. An observation hatch, with a forward-sliding cover, was placed in the fuselage roof between the aerial masts, and some aircraft were fitted with an unfaired D/F loop. The exhaust pipes were short, not exceeding the engine gill ring. Later machines, equipped with cabin heating, had a boiler jacket on the port exhaust. By early August 1939, 183 Mk.I aircraft had been issued to ten Bomber Command squadrons, while 6 Wellingtons, Type 403, were ordered by New Zealand, but in the event they were not delivered and were taken over by the RAF. At least eleven aircraft were modified with magnetic field generators as DWI Mk.IIs, with the degaussing ring suspended beneath the wings and fuselage, and used for the destruction of magnetic sea mines. The DWI stood for Directional Wireless Installation, which was a cover-up for special duty aeroplanes.

Wellington Mk.IA succeeded the first model in 1939, implementing a number of improvements intended for the subsequent Mk.II version. The engines were to be interchangeable, Pegasus or Merlin, but this capability was never used and only Pegasus XVIII were fitted, with metal Hamilton/de Havilland airscrews and small spinners. The unsatisfactory Vickers gun turrets gave way to the new hydraulically-operated Fraser-Nash type 5A units, with both bow and stern stations having two Browning MGs; a ventral turret, originally intended for the Mk.I, was also finally installed. A strengthened undercarriage was fitted, with the wheel axis moved slightly forward to allow for the increased gross weight of the aeroplane. Larger diameter wheels were employed, which, when retracted, were partially exposed. A new oxygen

supply and fuel jettison system, utilizing underwing jettison pipes, were implemented. The cabin windows were shortened by one panel in their front, while a new astro dome replaced the former sliding hatch. The D/F loop was enclosed in a streamlined container and a new fixed aerial arrangement was installed. Mk.IA production started in August 1939 and 187 aircraft were built at the Weybridge and Chester plants as Type 408, including 12 machines (Type 412) originally ordered by the RNZAF (eventually absorbed into the RAF). Four aircraft were converted to DWI Mk.I mine destroyers.

Wellington Mk.IC, Type 415, was the most widely produced Pegasus-engined variant, which included most improvements up to Mark II standard, but still retained some earlier features resulting in the somewhat inconsistent appearance of the aircraft throughout production. It had a redesigned hydraulic and electrical system, the latter introducing a higher voltage (24 volts in place of the original 12V system) to cater for aircraft and radio services. Early Mk.ICs were equipped with a front gun turret of smaller traverse, fit flush with the fuselage, while other machines had a cutout behind the turret to improve the gunner's angle of fire. The ventral FN25 turret, with two Browning guns, was only fitted to some production batches of Mk.IC aircraft. As the under turret proved to be inefficient, beam stations were introduced on later machines instead. Initially, tests were carried out on a Mk.IA, P9211, with a gun installed above the cabin window or in the window itself. The tested Vickers K guns were replaced by Brownings and the modification appeared on some Mk.IA and IC aircraft. Eventually, a further aft gun location, in a trapezoidal window, was standardized on late production Mk.ICs. The long night missions carried out by the majority of Wellington Mk.IA and ICs in service meant that a second pilot was also needed, thus increasing the size of the crew to six. Mk.IC aircraft were built within mixed orders of the Mk.I and Mk.IA variants between August 1939 and October 1942, and their production at all the Vickers-Armstrongs-managed factories totalled 2,685 aeroplanes. In March 1941 Type 423 modification was approved enabling a single 4,000lb bomb to be carried. The Mk.IC was also used as a torpedo-bomber; its prototype, the 'AD646', was tested at Gosport. Another 138 machines followed suit, with the provision to carry either one or two torpedoes, earning the nickname "Fishington". Early war experience, within Bomber Command, of unescorted daylight raids on German harbours and naval bases, clearly demonstrated heavy losses, so the Wellington was taken off such work at the end of 1939 and transferred, the following March, to only night bombing duties. In this role it performed well against numerous targets in occupied Europe, in the Western Desert, over the Mediterranean and in the Suez Canal Zone. The Wellington Mk.IA and ICs soldiered on well into 1942, when they were gradually replaced by the Mk.II and Mk.IIIs.

Wellington Mk.II was an improved version equipped with 1,148-hp Rolls-Royce Merlin X two-speed, supercharged, 12-cylinder, upright 60-degree in-line liquid-cooled engines. Designated Type 298, its development begun in January 1938, but the prototype, L4280, modified from a Mk.I airframe, was delayed and only flown on 3 March the following year. The programme was temporarily halted for six months in October 1938, due to the re-allocation of Merlin engines for fighter production, but later resumed, and another prototype, R3221, to represent the production standard as Type 406, was added. Its design reflected the experience obtained till then from operational use of the Mark I, and it featured general changes that were mostly implemented into the Mk.IA and Mk.ICs prior to full-scale production of the new version. These alterations included Frazer-Nash turrets, a modified undercarriage, improved hydraulic and oxygen systems, a 24V electrical system, cabin heating, an astro dome and a loop aerial container. Larger tailplanes were adopted to balance the forward shift of the centre of gravity caused by the heavier powerplants. The first prototype mounted Rotol right-hand airscrews, but series machines were fitted with de Havilland propellers. During production a new direct-vision windscreen, with a wiper for the pilot only, replaced the earlier installation. Beam gun stations were also incorporated on later machines and both sub-types, with or without the rear fuselage windows, could be seen in service. Many Mk.II aircraft had the starboard nose window blanked out too. Lorenz BA equipment was fitted and provision was made for tropicalisation. The first Mark IIs were delivered off the Weybridge assembly line in October 1940, with the last of the 200 batch being completed by the end of June 1942. The installation of a central beam for a 4,000lb bomb was investigated in early 1941, using three Mk.II aircraft as test-beds, and the modification was adopted for production without any change of designation. This option was available for all the Wellington Mk.ICs, Mk.IIs and later Marks. Several Mk.II aircraft were involved in experiments with 40mm Vickers 'S' gun installation and in the flight-testing of early jet engines, the latter being mounted in the rear fuselage in place of the rear turret.

The prototype Vickers B.9/32, K4049, was initially known as the Crécy. This picture was taken in 1936 at Eastleigh, Southampton, the home of Supermarine.

Wellington Mk.III was designed as further insurance against any failure in the supply of Pegasus engines. Although conceived as early as January 1938, with Hercules supercharged engines, and designated Type 299, the first prototype, L4281, did not fly until 19 May 1939. Its Bristol HE-1SM powerplants at first proved to be unsatisfactory, so after further development a second prototype, P9238, was prepared in January 1941 and fitted with 1,400-hp Hercules III engines. It passed into production at Chester and Blackpool as Type 417, internally improved and fitted with better armour protection of crew and fuel tanks. Other versions of Hercules engines were also used, Mks.X or XI, delivering 1,420 hp and 1,590 hp, respectively, and Rotol wooden propellers were to be fitted. All Hercules engines were 14-cylinder two-row air-cooled radials, with 2-speed superchargers. Engine exhausts were moved to the inner sides of the cowlings, while the position of oil cooler and carburettor air intakes changed compared with that of the Pegasus installation. Cabin windows were not installed, with their positions covered by fabric at the factory, while beam gun stations were fitted as a standard feature. A number of the first Mk.IIIs were equipped, as a temporary measure, with FN4A 4-gun rear turrets pending delivery of the improved servo-fed FN type 20A units.

The Wellington Mk.IIIs were also introduced to roles other than that of simply bombing – they were modified as torpedo carriers, long-range transport aeroplanes, mine-laying aircraft, paratroop carriers and as glider or fighter tugs (in case of towing, structural problems and fuselage deformation were encountered and the scheme was eventually abandoned). In general the Mark III was a remarkable advance on the previous variants as far as load-carrying capacity and performance were concerned, with its final gross weight reaching 34,500 lb. It became a main strike weapon of RAF Bomber Command until the arrival of the four-engined heavy bombers. By November 1943, 1,518 examples had been built, including two prototypes.

Wellington Mk.IV had American Pratt & Whitney Twin Wasp radial engines (14-cylinder two-row air-cooled units), the third alternative powerplant installation. Although other engines were also considered (the R-2800 Wasp and the R-1820 Cyclone), 1,050-hp R-1830 Twin Wasps were eventually installed in a prototype, R1220 (Type 410), which was first flown in early December 1940. The series aircraft, Type 424, were all Mk.IC modifications from the Chester production line, featuring FN5A two-gun front and rear turrets. Some Mk.IVs had the latter replaced by the FN20A and with the beam stations implemented. External distinguishing marks were smaller cowlings and exhaust pipes protruding through the gill rings. The tailplanes fitted were of small-chord type. Early aircraft employed Hamilton Standard propellers but they were replaced by Curtiss airscrews on later machines because of excessive noise. 220 Wellington Mk.IVs were produced in 1941-42, equipping mainly Polish and Australian squadrons.

Wellington Mk.X was the last bomber variant to be produced. As the airframe weight and loading reached their limit in the Mk.III, only the use of a newly-developed light alloy, DTD 646, would enable the strengthening of the aircraft structure and involve little by way of redesign. The gross weight was increased by 2,000 lb and more powerful engines were installed. The new powerplants, in the form of Hercules VI or XVI, each with an output of 1,616 hp, were tested in the 'X3374', a converted Wellington Mk.III. Another modified aircraft of the same Mark, the 'X3595', was used for Type 440 development in early 1942. Production aircraft were assigned Type number 448 and could also mount other Hercules XI and XVII engines (of 1,890 hp and 1,725 hp respectively). Externally they differed from Mk.III aircraft, with longer carburettor intakes and larger spinners over the Rotol propeller hubs, although a number of Mk.Xs also used de Havilland airscrews with small hubs. Beam guns and large tailplanes were fitted, while the cabin and the starboard nose windows were fully enclosed. The rear gun turret was initially of FN20A type, but FN120 or FN121 units were fitted to later aeroplanes, each mounting four Browning guns. New radio and navigational equipment was introduced to this Wellington version, resulting in aerial installation changes or additions. During production a new rudder and an elevator, with a different shape of horn balance, were implemented and improved the aircraft controls. Twin windscreen wipers were also fitted and a more efficient heating system was installed, involving fitting both exhaust pipes with "barbed" flame dampers. Mass-production of the aircraft, designated the B Mk.X when role prefixes were introduced in 1943, was split between Blackpool and Chester, and 3,796 examples were turned out. The first deliveries commenced in the autumn of 1942 and lasted until October 1945. The aircraft fulfilled all the roles of the Mk.III, and after being replaced by more modern bombers during 1943 (the last Wellington bombing mission was in October that year), it remained on general and operational training duties in the UK, while performing as a strategic bomber in the Middle East and India until the end of the war. Few Wellington operational units survived into the post-war era, the last being disbanded or re-equipped with the new types by early 1946. Some Mk.X aircraft were used as test-beds for high performance Hercules engines and for the Rolls-Royce Dart turbo-prop installation. From the surplus stocks about six Mk.Xs were sold as trainers to France after the war.

Wellington T Mk.X was a dedicated crew trainer aeroplane, of which 270 were converted, as Type 619, by Boulton Paul between January 1948 and March 1952. As a basis, both Mk.X bombers and Mk.XIX trainers were used, a number of which were available from RAF stocks in the early post-war period. The front turret was removed and substituted by a fairing, while the rear turret was stripped of its equipment and immobilized. The fuselage interior was modified to accommodate navigator trainees, and cabin windows were re-introduced on some aircraft. New sets of radio equipment, navigational aids, reconnaissance and other accessories were fitted. Improved hydraulic and pneumatic systems were installed as well as modified oxygen and heating systems. When Arabic numerals replaced Roman ones for the Mark designation in mid-1947, the aircraft became T Mk.10 and served with Advanced Flying and Air Navigation Schools until 1953.

Wellington T Mk.XIX emerged in 1948 as a local conversion of the B Mk.X, carrying out the duties of a basic bomber crew trainer. The aircraft were modified by Maintenance Units, usually with the front gun turret faired over, and equipped with dual controls for conversion training. Normally Hercules XVI or XVII engines were used. During service most T Mk.XIXs were brought up to T Mk.X standard. In 1947 the few Mk.XIX trainers still remaining operational were redesignated the T Mk.19. The Wellington bomber can truly be characterized as an aeroplane "that made history", taking part in action over major theatres of war. Built in far greater numbers than any other aircraft of its category, and famous for its unusual design and endurance against battle damage, it was perpetuated as one of the classic allied bombers of the Second World War. ■

List of abbreviations

A&AEE	Aeroplane and Armament Experimental Establishment
AFS	Advanced Flying School
ANS	Air Navigation School
ARI	Airborne Radio Installation
ASR	Air Sea Rescue
ATA	Air Transport Auxiliary
B	Buoyant (bomb)
BDU	Bombing Development Unit
CCDU	Coastal Command Development Unit
CGS	Central Gunnery School
CNS	Central Navigation School
CTU	Conversion Training Unit
D/F	Direction Finding (loop)
DR	Distant Reading (compass)
FAA	Fleet Air Arm
Flt.	Flight
FRS	Flying Refresher School
FTU	Ferry Training Unit
GRU	General Reconnaissance Unit
HC	High Capacity (bomb)
LC	Light Casing (bomb)
MU	Maintenance Unit
OCU	Operational Conversion Unit
OTU	Operational Training Unit
PR	Photo Reconnaissance
PRFU	Pilots Refresher Flying Unit
R/T	Radio Telephony
SBC	Small Bomb Container
SEAC	South East Asia Command
s/n	Serial Number
TBA	Tuneable Beam Approach
TSCU	Transport Supply Conversion Unit
TDU	Torpedo Development Unit
VAL	Vickers (Aviation) Ltd.
V-A	Vickers-Armstrongs Ltd.

Wellington Type numbers (Medium Bombers and Bomber Trainers)

Vickers Type No.	Description	Note
271	B.9/32 Crécy	prototype, s/n K4049, Bristol Pegasus X
285	Wellington Mk I	prototype, s/n L4212, Bristol Pegasus XX
290	Wellington Mk I	production, Bristol Pegasus XVIII
298	Wellington Mk.II	prototype (interim), s/n L4250, Rolls-Royce Merlin X
299	Wellington Mk.III	prototype (interim), s/n L4251, Bristol Hercules III
403	Wellington Mk.I	original order for RNZAF, Bristol Pegasus XVIII
408	Wellington Mk.II	production, Rolls-Royce Merlin X
408	Wellington Mk.IA	3 turrets, Bristol Pegasus XVIII
409	Wellington Mk.IB	similar to Mk.IA with armament modifications, no production record
410	Wellington Mk.IV	prototype, s/n R1220, Pratt & Whitney Twin Wasp
412	Wellington Mk.IA	later order for RNZAF, Bristol Pegasus XVIII
415	Wellington Mk.IC	production, Bristol Pegasus XVIII
416	Wellington Mk.II	dorsal turret for 40mm Vickers 'S' gun, conversion, s/n L4250, R-R Merlin X
417	Wellington Mk.III	production, Bristol Hercules III
423	Wellington all Mks.	modification to carry 4,000lb bomb, approved for Mks.IC, II and later Mks.
424	Wellington Mk.IV	production, Pratt & Whitney Twin Wasp
430	Wellington Mk.II	conversion, s/n T2545, R-R Merlin XX cancelled, R-R Merlin 60 test-bed
437	Wellington Mk.IX	converted Mk.IA s/n P2522 to a special troop carrier, no production
439	Wellington Mk.II	s/n Z8416/G, installation of 40mm Vickers 'S' gun in nose
440	Wellington Mk.X	prototypes, s/n X3374 and X3895, Bristol Hercules VI or XVI
445	Wellington Mk.II	s/n Z8570/G, R-R Merlin X + BTH W2B jet engine in tail
448	Wellington Mk.X	production, Bristol Hercules VI
450	Wellington Mk.II	s/n W5518, superseded by Type 486
451	Wellington Mk.III	s/n BK537, Bristol Hercules III, Rotol propeller test-bed
452	Wellington Mk.IC	mine laying trials
470	Wellington Mk.II	s/n W5388/G, Mk.VI wings, R-R Merlin 62 + Rover-Whittle W2B jet engine
478	Wellington Mk.X	s/n LN718, Bristol Hercules 100, Viking engine test-bed
486	Wellington Mk.II	s/n W5518/G, R-R Merlin X + W2/700 jet engine
---	Wellington T Mk.XIX	service conversion of Mk.X, Bristol Hercules XVI
619	Wellington T Mk.X	conversion of Mk.X and T Mk.XIX by Boulton Paul, Bristol Hercules XVII

Technical description of Vickers-Armstrongs Wellington Mks.I, IA, IC, II, III, IV, B Mk.X, T Mk.X/T Mk.10 and T Mk.XIX/T Mk.19

The Wellington aeroplane was a twin-engine mid-wing monoplane, of all-metal geodetic construction, with a fabric covering and fitted with a tricycle retractable undercarriage. It was designed and equipped for duties as a medium day/night bomber, although it could also be used as a torpedo bomber, crew trainer or for long-range reconnaissance tasks. It carried a crew of 4/6 (Mk.I) or 5/6 (other Marks), depending on the mission and equipment.

The fuselage is a geodetically-braced structure, of oval section and straight taper, built of light alloy, with open frames permitting free passage from the front to the rear. The bracing itself consists of diagonal members, arranged in a diamond pattern, secured to each other by gussets and cleats, and bolted to the frames and longerons. The fuselage is constructed in two separate portions, the front and the rear, joined together behind the trailing edge frame at station Nos.61–62. Each portion of the fuselage comprises top, side and bottom panel structures, attached to four tubular longerons and secured to the terminal rings in the front and rear, and to the intermediate frames. Wooden stringers are fitted to the geodetic members and faired over by doped fabric, applied in diagonal bands, with seams covered by doped-on strips. The fuselage front portion, with four frames, accommodates the bomb aimer's compartment and the pilot's cockpit (between station Nos.8 and $12^1/_2$). The pilot's seat, adjustable for height, is mounted on the port side on a floor pedestal, while the second pilot is provided with a folding seat hinged to the starboard sidewall. The radio operator and navigator's stations are placed immediately behind the cockpit, bordered by frame Nos.$12^1/_2$ and $22^1/_2$, with the navigator occupying the rear section. The cabin is sound-proofed by Woolfelt or Seapak material. The main entrance to the fuselage is through a forward lower hatch, while a walkway is provided along the starboard side of the cabin and in the centre of the rear fuselage. The pilot's cockpit is enclosed by a transparent hood, with two aft-sliding side windows and upward-opening two-piece roof panels. Early production machines have outward-opening hinged corner windows on either side of the windscreen. Later aircraft, from the Mk.IC onwards, have a direct-vision panel that opens inwards. Initially a single windscreen wiper is fitted, but later aeroplanes have two. Cabin windows are installed on both sides of the fuselage of Mks.I, IA, IC, II, IV and early III, while the Mark X and later Mk.IIIs are not provided with these windows. An extra transparent panel is only fitted to Mk.I aircraft, thus extending the window further forward towards the cockpit sliding panels. On other later aircraft the cabin windows can be blanked out or painted over. The pilot's sidewall window, located in the starboard fuselage nose, is also faired over on later machines. A hatch with a sliding cover (Mk.I aircraft) or a transparent dome (other Marks) is provided amidships in the roof of the fuselage. Below the cabin floor, made of plywood panels, there is a bomb bay extending from station No.$12^1/_2$ to No.85. Inside this compartment twin beams, running the length of the bomb bay (and thus forming three cells), are incorporated to carry the bombs. The bay doors, either fabric or metal-covered, are arranged in five rows of six panels each. The centre bomb cell has a single row of doors hinged to the port bomb beam rail, while the outer bomb cells each have a double row of doors hinged on the inner side to the beam rails and on the outer side to the rails carried by the bottom longerons. Aircraft with Type 423 modification have the normal bomb beams replaced by a special tubular beam mounted centrally on the bay ceiling. In this instance the bomb bay is left open at the base, retaining only the outer doors. Above the bomb compartment, in the side panels at station No.40, reinforced apertures for the continuous main plane spar are provided. The rear portion of the fuselage structure is supported by pairs of mid and tail frames. The lower panel has a circular opening to accommodate a retractable under-turret (some Mk.IA and ICs only). In other aeroplanes it is adapted for use as an emergency or AFE exit hatch, or as a multiple flare chute, or it is sealed by a cover made of wooden stringers and doped fabric. A rhombic push-out panel for emergency exit is located on the starboard lower side at station No.67, while a further opening is provided between the tail frames for the tailwheel unit. The tail frames, and the side and top frames, have fittings for the attachment of the tailplane and fin. On Mk.X aircraft a new aluminium alloy, DTD 646, with better strength-to-weight ratio, is used throughout the structure. The front and rear gun turrets are supported on braced beams (Mk.I aircraft) or on mounting rings (other Marks) secured to the fuselage terminal frames. The turrets in Mk.I aeroplanes are fitted as integral parts of the fuselage, with fixed transparent hoods, side panels and articulated gun shutters, while other versions have separate turret units with Perspex cupolas. Armour plating, affording protection against gunfire from the rear, is provided within the gun turrets, at the sextant dome (folding plate doors hinged to a central post), behind the W/T operator's seat (between another central post and the port side of the fuselage) and under the navigator's table.

The wings, of a geodetically-braced cantilever structure, taper uniformly in chord and thickness towards their tips. The aspect ratio is 8.83:1, while the aerofoil section employed is NACA 24. The wings are built in two portions, forming inner and outer main planes, at the junction of which the engine nacelles are assembled. The main spar, traversing the fuselage, is manufactured in four sections consisting of open-braced Warren-type girders with tubular beams and bracing members, the former being doubled from the centre up to half of the wing span. The sections are pin-jointed together at the nacelles and at the fuselage centre line. Two auxiliary spars, the leading edge and trailing edge members, are attached to the wing root ribs and to the corresponding fuselage frames. Two boundary ribs at the nacelles and another five ribs within the outer main plane serve as the wing bracing members. The geodetic surface bracing, with the grid mutually shifted on the upper and lower sides, is secured to the spars. Two sets of three-piece self-sealing fuel tanks are carried in each outer main plane. The wings are fabric-covered, while the leading edges and tips are reinforced with sheet metal. Shrank-type metal split flaps, built in three sections, extend along the trailing edge from the wing roots to the ailerons of semi-Frise type. The ailerons are of metal structure, mass-balanced and fabric-covered, and are fitted with inset trimming tabs. The port tab is controlled by the pilot while the starboard tab is adjustable only on the ground. The nacelles, of monocoque construction, carry the engine mountings on their forward bulkheads, while the undercarriage legs are attached to two transverse tubular frames in the centre of each nacelle. A bridge piece passes across the forward portion and forms a continuation of the leading edge spar. The surface of each nacelle consists of five streamlined panels attached by quick-release fasteners; in the bottom front and rear pairs of doors cover the undercarriage wheel well. Each nacelle also contains an oil and fuel tank; the starboard rear nacelle houses a duralumin container for an inflatable dinghy, while the port unit mounts an airscrew de-icing tank. Flotation gear CO_2 cylinders are installed in each inner main plane, with a 7.28lb Mk.III and 3.7lb Mk.II cylinders on the starboard side, and only a single Mk.III cylinder on the port side. Two forced-landing flare-launching tubes are housed diagonally in the port inner main plane (not fitted to later Mk.III and Mk.X a/c), while two 360W retractable landing lamps, Type H, are fitted on the underside of the port outer wing, between station Nos.18 and 20. A pressure head is mounted beneath the starboard main plane (Type 298 Mk.VIIID on aircraft equipped with 24V electrical system). Internal mooring rings for ground picketing are located on each side, below the wings, between station Nos.11 and 12.

The tail unit is of a cantilever geodetic construction and comprises separate tailplanes and elevators on each side of the fuselage, and the fin and rudder on its top. The tailplane is bolted to the fuselage frames at station Nos.82, 85 and 90, while the fin is fitted to the frames at station Nos.81, 85 and 90. Their construction is similar to that of the main plane and consists of unbraced tubular booms, leading and trailing edge spars, root ribs and other flanged ribs. All components are fabric-covered, with the exception of the leading edges and the tips that are sheet-metal covered. Each elevator and the rudder are hinged at four points; the former being horn-balanced while the latter is mass-balanced. Both control surfaces are fitted with inset trimming tabs, which, in the case of those on the elevators, are interconnected with the wing trailing edge flaps. On Mk.II aircraft a larger tailplane is introduced, with an increased chord by 1', which is also a standard feature of Mk.III and X aeroplanes. The tailplane is modified yet again on later Mk.Xs (including the 'LN', 'MF', 'NA', 'NC' and 'RF'-serialled machines) to accommodate a different shape of horn balance. The rudder is also horn-balanced on these aircraft and its trimming tab is increased in area.

The undercarriage, fully retractable by hydraulic power, comprises two main units and a castoring tailwheel incorporating Vickers oleo-pneumatic shock-absorbers. The main wheel leg, consisting of twin tubular struts and folding backstay, is pivoted within the engine nacelle to the main plane structure and is actuated by a single hydraulic jack. On retracting the undercarriage folds upwards and rearwards into the nacelle, the aperture in the nacelle closing automatically by hinged four-piece doors. Dunlop AH.2197 wheels with Dunlop tyres are fitted to Mk.I aircraft. Subsequent Marks have a strengthened undercarriage with longer backstays, moving the chassis forward by 3", and Dunlop AH.10158 wheels, with 46" x 17" or 43.3" x 15.8" (1,170 x 430 or 1,100 x 400 mm) Dunlop tyres, are employed. The wheel brake system is Dunlop pneumatic. The tailwheel unit, pivoted to two beams on the fuselage tail frames, is also actuated by a single jack and retracts simultaneously with the main gear, folding back completely within the fuselage. A Dunlop AH.2186 wheel (on Mk.I and Mk.II aeroplanes) or AH.10223 unit (later a/c), and Dunlop tyres are used and fitted to the tailwheel fork, of which two types exist. All undercarriage units are held in their retracted positions by the pressure in the hydraulic jacks, and in their lowered positions by mechanical locks. On late Mk.IA aircraft the tailwheel well doors are replaced by fixed flush fairings.

The powerplants used in various Wellington variants are dealt with in the main text. The radial-powered aircraft have their engines mounted on tubular rings sup-

Refuelling and bombing-up of a Wellington – a typical scene at bombing stations during early war years.

ported by a W-shaped structure fitted to the nacelle fireproof bulkhead. In the case of Mk.II aircraft, the engine mounting consists of a tubular steel structure created by a system of triangular frames. Air-cooled powerplants and their accessories are enclosed by NACA-type cowling, comprising a nose ring (which also forms an exhaust collector ring), a two-piece wrapper cowl, a gill ring, a deflector ring and four rear panels. The in-line engine cowling is made of detachable side, top and bottom panels, secured in place by fasteners. The engines exhaust through branches leading from the cylinders to the nose rings and to pipes on the outer sides of the engines (Mks. I, IA, IC, IV aircraft), or on the inner sides (Mks.III, X), or through three ejector manifolds on each side of the engine (Mk.II aeroplanes). The port exhaust pipe of the radial-powered aircraft is longer and incorporates a boiler jacket (part of the heating system), while the starboard ejector pipe is short (not exceeding the gill ring) on Mk.I and some Mk.IA aeroplanes, or fitted with a long "barbed" flame damper (Mks.IC, III, IV, X). On later Mk.Xs and on the T Mk.10s, the flame dampers are installed on both exhausts. Each engine is started by an electric motor or, alternatively, using a starting handle. The following three-bladed propellers are fitted to particular versions: Mks.I, IA, IC – de Havilland constant-speed metal, of 12'6"/3,810mm diameter; Mk.II – de Havilland Hydromatic C/S metal, of 12'9"/3,890mm diameter; Mks.III, X – Rotol Electric or Hydraulic C/S wooden, both of 12'9"/3,890mm diameter, or de Havilland 6500 Hydromatic C/S metal; Mk.IV – Hamilton/de Havilland C/S metal (early a/c) or Curtiss Electric DF.16 C/S metal (later a/c), both of 12'3,660mm diameter. A right-hand type airscrew is used on Mk.II and IV aircraft, while other Marks use propellers that rotate in the opposite direction. An airscrew de-icing system is fitted (except later Mk.III and X aircraft), with a 6.5-gal (29.8-litre) reservoir in the port engine nacelle, but a de-icing paste can be used instead. Fuel for each engine is supplied separately, from their own systems, by engine-driven pumps. Both systems, interconnected by a balance pipe, draw fuel from the tanks in the main plane, grouped fore and aft of the spar outboard of the engine nacelle, and from two tanks contained in the nacelles themselves. Their capacities are: front wing tanks 150 gal each, rear wing tanks 167 gal each and nacelle tanks 58 gal each, making 750 gal (3,410 litres) in total. All tanks are of light alloy construction, with each wing tank consisting of three separate cells with external intercommunicating pipes. The filler caps are on the top face of each outboard cell. Additional fuel for long-range flights can be carried in cylindrical overload tanks in place of bombs, and extra fuel for ferrying in the tanks in the fuselage. A fuel jettison system is fitted from the Mk.IA aircraft onwards, with ejected fuel conveyed through pipes beneath the outer main planes. The oil supply for each engine is contained in a 16-gal (73-litre) tank mounted in the nacelle, between the fireproof bulkhead and fuel tank. An auxiliary 18-gal (68-litre) oil tank is placed on the starboard side of the fuselage behind the wing spar. On Mk.I, IA and IC aircraft the carburettor air intake is mounted beneath the engine, while two oil cooler inlets are placed between the upper cylinders and project slightly forward of the nose ring. Mks.III, IV and X have the carburettor air intake above the engine, while the lower intake supplies air to the oil cooler. On Mk.II aeroplanes a deep radiator bath, with twin coolant radiators, a single oil cooler and radiator shutter, is mounted beneath each engine, while two side air scoops lead air to the carburettor. Coolant header tanks (Mk.II only) are mounted over the front of each engine, with the port engine tank of 15-gal (68-litre) capacity and that on the starboard side containing [illegible] gallons (64 litres). The former has a greater capacity because it is connected to the heater of the internal heating system.

The hydraulic system, of Vickers type, employs two engine-driven pumps mounted on the port engine. One pump operates the gun turrets (Type IH Mk.I twin pump on early aircraft, or Types IHD and IHC on aircraft from the Mk.III onwards), while the other (Type VSG pump from Mk.IC aircraft, or two Lockheed Mk.8 pumps on the T Mk.10) supplies the general services, undercarriage, flaps, bomb doors, carburettor air intake shutters (not on Mk.I, IA, IC), radiator shutters (Mk.II only) and windscreen wipers (Mk.IC and higher Marks). The operating pressure is max. 1,300 psi (8,967 MPa), or, on the T Mk.10, 1,700 psi (11.726 MPa). The main reservoir, located behind the cockpit bulkhead at the top, contains 1.56 gal (7 litres) of oil.

The pneumatic system. Two air compressors are driven by the starboard engine: the RAE supplies the automatic controls, and the BTH/AV operates the wheel brakes and the fuel jettison valves. On Mk.X aeroplanes an AC Mk.I compressor is used for auto-controls, while other systems are secured by a Heywood unit. Air is stored at a pressure of 200 psi (1.379 MPa) in two cylinders on the starboard side of the cabin, aft of the wing spar. In the case of the T Mk.10, a more powerful Hymatic compressor is employed, while three cylinders store air at a pressure of 450 psi (3.104 MPa).

The oxygen system. Fifteen or sixteen 750-litre oxygen cylinders (Mks.I, IA, IC, early Mks.II and III, and Mk.IV, or late Mks.II and III, and Mk.X, respectively) are stowed in two carriers on the roof sides, aft of the leading edge frame. On T Mk.10 aircraft the number of cylinders is reduced to 13. The oxygen is supplied via Mk.VIIIA or VIIIA* regulators at various crew stations in the fuselage and in the gun turrets.

The heating system. The interior of the aircraft can be warmed by a heating duct system, with air entering through slots in the leading edge of the port inner main plane. The air passes via the heater, supplied by steam generated in a water boiler on the port engine exhaust (Mk.I, IA, IC, IV and early Mk.III aircraft), or supplied directly by exhaust gases from the port engine (late Mk.III and Mk.Xs). In the case of the Mk.II, the heater employs hot coolant fluid instead of steam. The warmed air is then conveyed through a main duct and discharged using branches and controllable outlets at the pilot and crew's stations in the cabin. The front, rear and beam gunners are provided with electrically-heated clothing.

Bobcat Bathgate collection

As a distant storm closes in, a Coastal Command Wellington Mk.IC receives final instructions before take-off from Talbenny airfield.

The ultimate role of the Wellington was crew training. A T Mk.10, MF628, is flying low over Hatfield on 14 June 1953.

The electrical system. Power for the electrical services is derived from an engine-driven generator, supplying a 12V current in the Mk.I and Mk.IA, or 24V in subsequent versions, mounted on the port engine (Mks.I, IA, IC), on the starboard engine (Mks.II, III, IV), or on both engines (Mk.X). A 500W generator is used in Mk.I/IA aircraft, a 1,000W Type K in Mk.IV aircraft, a 1,800W Type KX in Mk.II and Mk.III aircraft, a tandem unit of 1,000W DC and 800W AC generators, Type RK, in the Mk.X, or 1,800W DC and 1,200W AC generators in the T Mk.10. A single 12V 40A battery, Type D (Mks.I, IA), or two 12V units (other versions), connected in series in the cabin, provide electrical supply for all the lighting, lamps and indicators, engine starting, auto controls, propeller feathering, fire extinguishing, the operation of camera and flotation gear, pressure head and camera heating, the release and inflation of the dinghy, flare release, bomb fusing and release, torpedo camera and release, and radio equipment.

The aeroplane controls. The flying controls, orthodox in operation, consist of a handwheel-type control column and a rudder bar, which is adjustable for leg reach. They are connected to the control surfaces by a system of push-pull rods. Dual controls, operated from the cockpit starboard seat, can be linked up with the main controls. Trimming tab controls operating tabs on the elevators, rudder and port aileron through a cable system, are mounted on the left-hand side of the pilot's seat. The trailing edge flaps control is located beneath the centre of the instrument panel. Provision is made for automatic flying controls, the Mk.IV (Mk.I, IA, IC, II, III and IV aircraft) or the Mk.VIII auto-pilot (Mk.Xs). The control locking gear is fitted, in the form of a hinged frame and "nuisance bar". The engine controls are grouped in a control box on the port side of the cockpit. When dual flying controls are installed, other throttle controls are mounted on the starboard side of the cockpit floor extension. Airscrew speed controls are at the rear of the control box, while their electrical controls are located in the centre of the instrument panel. Undercarriage and tailwheel operation is controlled by a lever below the instrument panel, while the pneumatic wheel brakes are operated by twin levers on the handwheel.

Vickers-Armstrongs Wellington Mks.I, IA, IC, II, III, IV, X and T Mk.10 technical data

Length, overall/fuselage	- Mk.I	64'7"/61'3" (19,690/18,670 mm)
Length, overall/fuselage	- other Marks	64'7"/61'0" (19,690/18,590 mm)
Wing span, all Marks		86'2" (26,260 mm)
Wing chord, at root/tip		14'7"/4'3" (4,450/1,270 mm)
Tailplane/elevator span		27'2.5"/30'6.7" (8,290/9,370 mm)
Tailplane chord, at root/tip	- Mk.I, IA, IC	6'5.4"/3'3" (1,970/990 mm)
	- Mk.II, III, IV, X	7'5.4"/3'3" (2,270/990 mm)
	- some Mk.X, T Mk.10	7'5.4"/3'5.1" (2,270/1,050 mm)
Height, all Marks		12'2" (3,760 mm)
Wheel track		20'4" (6,200 mm)
Wing/tailplane incidence		4°±1°/3°30'±1°
Wing dihedral, centre plane/outer plane		1°45'±1°/1°30'±1°
Aileron/flap deflection angle		+18°33'-14°53'/-68°46'
Elevator/rudder deflection angle		±24°10'/±23°20'
Wing/flap area, total		753.00/77.20 sq ft (69.96/7.17 m²)
Tailplane & elevator area	- Mk.I, IA, IC/II, III, IV, X	110.00/122.10 sq ft (10.22/11.34 m²)
Fin & rudder area, total	- Mk.I, IA, IC/II, III, IV, X	85.40/87.90 sq ft (5.15/8.38 m²)
Weight, empty	- Mk.I/IA/IC/II/III/IV/X	18,000/18,500/18,800/20,244/20,856/20,055/22,340 lb (8,170/8,390/8,530/9,180/9,510/9,100/10,130 kg)
max. take-off	- Mk.I/IA/IC/II/III/IV/X	24,650/27,100/30,000/32,000/34,500/31,500/36,500 lb (11,270/12,290/13,610/14,820/15,650/14,290/16,560 kg)
Max. speed, at altitude	- Mk.I/IA, IC	248/235 mph (395/380 km h⁻¹) at 15,000 ft (4,570 m)
	- Mk.II	254 mph (410 km h⁻¹) at 17,500 ft (5,330 m)
	- Mk.III	261 mph (420 km h⁻¹) at 12,500 ft (3,810 m)
	- Mk.X	255 mph (410 km h⁻¹) at 13,300 ft (4,050 m)
diving	- Mk.III, IV, X	320 mph (515 km h⁻¹)
Cruising speed	- Mk.I/IC/II/III	180/195/180/180 mph (280/315/290/240 km h⁻¹)
Stalling speed, flaps & u/c up/down	- Mk.II	79/67 mph (130/110 km h⁻¹)
	- Mk.III & X	80/70 mph (130/115 km h⁻¹)
Landing speed	- Mk.III & X	85 mph (135 km h⁻¹)
Rate of climb	- Mk.I/IA/II/III/IV/X	475/670/670/808/500/1,030 ft/min (2.4/3.4/3.4/4.1/2.5/5.2 m s⁻¹)
Climb to 10,000 ft	- Mk.I/IA/IC/II/III/IV/X	17.7/13.3/25.0/13.1/16.1/20.8/12.5 min
Service ceiling	- Mk.I/IA/IC/II/III/IV/X	21,600/18,500/18,000/23,500/22,700/17,400/19,300 ft (6,580/5,640/5,490/7,160/6,920/5,300/5,880 m)
Take-off run	- Mk.I/IA/II/III/IV	440/440/750/680/640 yd (400/400/690/600/590 m)
Take-off run to 50ft	- Mk.I/IA/IC/II/III/IV/X	710/865/1,300/1,300/1,035/995/900 yd (650/790/1,190/1,190/950/910/820 m)
Range, max. at 180 mph (290 km h⁻¹) at 15,000 ft (4,570 m)	- Mk.I/IC/II/III/X	3,200/2,550/2,200/2,040/1,685 miles (5,150/4,105/3,540/3,285/3,035 km)

Designation	Type No.	Production, manufacturer	Serial number (s/n) and quantity	First flight (ff) / delivery (d)/built (b)	Qty. ordered	Qty. built	Qty. conv.	User	Unit / institute	Note
B.9/32 Crécy	271	prototype, VAL	K4049	(1)	ff 15/6/36		1	RAF	A&AEE	renamed Wellington 9/36, crashed 19/4/37
Specification 29/36	285	prototype, VAL	L4212	(1)	ff 23/12/37	180	1	RAF,	A&AEE,	
Wellington Mk.I	290	1st prod. order 1st prod. batch VAL Weybridge	L4213–4310 L4317–4329, 4331–4336, 4341–4348, 4351–4354, 4356–4359, 4361–4391 R2899–2703	(98) (70) (5)	L4213 ff 9/9/38 34 a/c d 1938		173	FAA	RAE, 9, 37, 38, 75, 99, 109, 115, 148, 149, 214, 215, 11, 12, 15, 20, 21, 23, 25, 26,	L4213 flap and elevator trials; L4221, 4359 bombing trials; L4223, R2700 handling trials; L4285 arm. trials; L4250 became Type 298 Mk.II and L4251 Type 299 Mk.III, L4244 → RN for ASV training, L4255 conv. to ambulance; L4212, 4221, 4227, 4356, 4358 → DWI Mk.II; L4354, 4385 air photography equipment trials
	403		L4311, 4330, 4340, 4350, 4355, 4360	(6)			6			originally ordered as N2300 – N2306 for RNZAF but not delivered, serials retained within RAF
	290	2nd prod. order 1st prod. batch V-A Chester	L7770–7772	(3)	whole prod. batch d 4/8/39 – 27/6/40	(100)	3		29 OTU; 782, 783 NAS	remaining 97 a/c built as 17 Mk.IA and 80 Mk.IC L7771 → Type 419 DWI Mk.II
SUBTOTAL							183 *			* including prototype Mks.II & III
Wellington Mk.IA	408	2nd prod. order 1st prod. batch V-A Chester	L7773–7789	(17)	whole prod. batch d 4/8/39 – 27/6/40	(100)	17	RAF	A&AEE; 9, 37, 38, 57, 75, 99,	built within original 2nd order for 100 Mk.I, remaining 83 a/c built as 3 Mk.I and 80 Mk.IC L7776 later converted to C Mk.XV
		4th prod. order 2nd prod. batch VAL Weybridge	N2865–2873, 2880–2914 N2935–2936, 2943–2964 N2960–3019	(44) (24) (40)	N2865 – 2867 d 8/39 remaining a/c d 3/11 – 27/12/39	120	108		115, 149, 150, 162, 214, 215,	N2963 test-bed for FN36; N2865, 2955 arm. trials ; N2867, 2871, 2875, 2877, 2880, 2886, 2887, 2909, 2944, 2947, 2954, 2955, 2958 later conv. to C Mk.XV
	412		N2874–2879 N2937–2942	(6) (6)			12		311; 15, 20, 21,	originally allocated to RNZAF as N2305–317 but not delivered, taken over by RAF with 'N'-serials
	408	5th prod. order 3rd prod. batch VAL Weybridge	P2515–2532 P9205–9236	(18) (32)	whole prod. batch d 8/1 – 11/44/40	(100)	50		27, 28, 30 OTU; 1 GRU	remaining 50 a/c built as 49 Mk.IC and 1 Mk.III; P9211 → A&AEE beam gun instal. and firing trials; P2519, 2521, 2528, 9206, 9222, 9231 later conv. to C Mk.XV; P2518 Type 418 DWI Mk.I prototype; 2518, 2521, 2522, 9223 → DWI Mk.I
SUBTOTAL							187			
Wellington Mk.IC	415	2nd prod. order 1st prod. batch V-A Chester	L7790–7819 L7840–7874 L7885–7899	(30) (35) (15)	whole prod. batch d 4/8/39 – 27/6/40	(100)	80	RAF, RCAF RAAF	A&AEE: 9, 15, 28, 36, 37, 38,	built within original 2nd order for 100 Mk.I, remaining 20 a/c built as 3 Mk.I and 17 Mk.IA
		3rd prod. order 2nd prod. batch V-A Chester	N2735–2784 N2800–2829 N2840–2859	(50) (30) (20)	d 2/7 – 22/8/40	100	100		40, 57, 69, 70, 75, 93, 99, 101,	N2761 Vokes filter trials A&AEE, 7/40; N2755, 2801, 2856, 2857 later conv. to ☒ Mk.XVI
		5th prod. order 3rd prod. batch VAL Weybridge	P9237, 9239–9250 P9265–9300	(13) (36)	whole prod. batch d 8/1 – 11/44/40	(100)	49		103, 108, 109, 115, 148, 149,	built within original 5th order for 100 Mk.IA; P9238 became Type 417 Mk.III prototype, P9289 later converted to C Mk.XVI
		6th prod. order 3rd prod. batch V-A Chester	R1000–1049 (50) R1060–1099 (40) R1135–1184 (50) R1210–1218, 1221–1254 (44) R1265–1299 (35) R1320–1348 (30) R1365–1389, 1391–1414 (49) R1435–1474 (40) R1491–1509, 1511–1514, 1516–1519, 1521–1524, 1526–1529, 1531–1534, 1536–1539 (43) R1586–1588, 1591–1609, 1611–1614, 1616–1619, 1621–1624, 1626–1629 (38) R1640–1649, 1651–1654, 1656–1669 (28) R1695–1704, 1706–1714, 1716–1724, 1726–1729 (31) R1757–1764, 1766–1774, 1776–1784, 1786–1794, 1796–1806 (46)		d 22/8/40 – 8/41	(550)	525		150, 156, 162, 192, 214, 215, 218, 221, 294, 300, 301, 304, 305, 311, 419, 458, 14, 15, 16,	R1220 became Type 416 Mk.IV prototype, other 24 Mk.IC converted on line to Mk.IV; R1628 general bombing duties tests A&AEE, 7/41; R1032, 1144, 1172, 1409, 1452, 1521, 1531, 1600, 1605, 1659, 1668, 1700, 1710, 1711, 1720 later converted to C Mk.XVI
		7th prod. order 4th prod. batch VAL Weybridge	R3150–3179 R3195–3220, 3222–3239 R3275–3297	(30) (44) (23)	d 12/4 – 9/5/40	(100)	97		20, 21, 22, 23, 24, 26, 27, 28,	R3221 became Type 405 Mk.II prototype; R3155 A&AEE, 12/40; R3298, 3299 conv. on line to Mk.V; R3217, 3225, 3234, 3237 later conv. to C Mk.XVI
		8th prod. order 5th prod. batch VAL Weybridge	T2458–2477 (20) T2501–2520 (20) T2541–2544, 2546–2550 (39) T2608–2625 (20) T2701–2750 (50) T2801–2850 (50) T2873–2918, 2920–2922 (49) T2951–2976, 2978, 2980, 2981, 2983–2987, 2989–2997, 2999, 3000 (45)		d 10/5/40 – 7/2/41	(300)	293		30, 105, 109 OTU; 1383 TSCU; CCDU	T2545 conv. to Mk.II, became Type 430 with Merlin XX but later cancelled, test-bed for Merlin 60 engines (with 4-bladed props) with R-R; T2919, 2977, 2979, 2982, 2988, 2998 converted on line to Mk.VIII; T2850, 2920, 2969 later conv. to C Mk.XVI
		9th prod. order 6th prod. batch VAL Weybridge	W5352 W5612–5614, 5616–5618, 5620–5622, 5624–5630 W5644, 5646, 5648, 5650, 5652, 5654, 5656, 5658, 5660, 5663–5670, 5673, 5675, 5677, 5679–5690 W5703–5724, 5726, 5727, 5729	(1) (16) (32) (25)	whole prod. batch d 7/10/40 – 4/5/41	(300)	74			built within original 9th order for 300 Mk.II; W5352 built as Mk.II, subst. for T2545; W5615, 5619, 5623, 5631, 5645, 5647, 5649, 5651, 5653, 5655, 5657, 5659, 5661, 5662, 5671, 5672, 5674, 5676, 5678, 5725, 5728, 5730–5735 conv. on line to Mk.VIII; W5686, 5709 later conv. to C Mk.XVI
		11th prod. order 1st prod. batch V-A Blackpool	X3160–3179 X3192–3221	(20) (30)	whole prod. batch d 8/8/40 – 8/7/42	(500)	50			remaining 450 a/c built as Mk.III; X3171 night photography trials A&AEE; X3191 bombsight tests; X3193 later converted to C Mk.XVI
		12th prod. order 4th prod. batch V-A Chester	X9600–9644 (45) X9658–9707 (50) X9733–9767 (35) X9785–9834 (50) X9871–9890 (20) X9905–9954 (50) X9974–9993 (20) Z1040–1054 (15) Z1068–1115 (50) Z1139–1181 (43)		d 10/5/41 – 9/3/42	(710)	378			remaining 332 a/c built as 137 Mk.III and 195 Mk.IV; X9948 test-bed for air photography equipment and techniques, RAE; Z1101 navigation research 6/42; X9963, X9978, Z1071, Z1150 later conv. to C Mk.XVI
		14th prod. order 9th prod. batch VAL Weybridge	Z8704, 8709, 8711, 8714, 8716, 8718, 8720, 8722, 8724, 8726, 8728–8736 (19) Z8761–8810 (50) Z8827–8871 (45) Z8891, 8893, 8894, 8896, 8897, 8899–8901, 8903, 8904, 8906, 8907–8910 (15) Z8942–8991 (50) Z9016–9045 (30) Z9095–9114 (20)		d 7/5 – 30/11/41	(250)	229			Z8771, 8772 aux. tank inst. trials, both to USA 8/41; Z8702, 8703, 8705 – 8708, 8710, 8712, 8713, 8715, 8717, 8719, 8721, 8723, 8725, 8727, 8892, 8895, 8898, 8902, 8905 conv. on line to Mk.VIII, Z8709, 8831, 8850 later converted to C Mk.XVI
		15th prod. order 10th prod. batch VAL Weybridge	AD569–608 AD624–653	(20) (30)	d 6/12/41 – 5/1/42	50	50			AD648 torpedo-bomber prototype, trials a/c → TDU Gosport
		16th prod. order 11th prod. batch VAL Weybridge	BB455–460, 462–465, 467–470, 472–475, 477–480, 481–484 BB497–502, 504–512, 514–516	(25) (18)	d 6/1 – 11/2/42	(150)	43			BB461, 466, 471, 476, 481, 503, 513 converted on line to Mk.VIII, rest of order cancelled (100 a/c)
		20th prod. order 6th prod. batch V-A Chester	DV411–458 (48) DV473–522 (50) DV536–579 (44) DV593–624 (32) DV636–678 (41) DV694–740 (47) DV757–786 (30) DV799–846 (48) DV864–898 (35) DV916–953 (40)		d 11/11/41 – 13/6/42	415	415			DV427 A&AEE, 1/42; DV491, 594, 617, 704, 735, 761, 762, 822, 886, 920, 921, 924, 942 later converted to C Mk.XVI
		21st prod. order 13th prod. batch VAL Weybridge	ES980–985 ES987–995	(6) (9)	d 10 – 19/2/42	(16)	15			ES986 converted on line to Mk.VIII
		22nd prod. order 7th prod. batch V-A Chester	HE942–991 HE101–134 HE146	(50) (34) (1)	d 13/6/42 – 11/42	(1,124)	85			remaining 1,039 a/c built as 789 Mk.X, 5 Mk.XII and 242 Mk.XIV
		24th prod. order 14th prod. batch VAL Weybridge	HF829–837, 839–849, 851–853, 855, 856, 858, 859, 861, 862, 864, 865, 867, 868 HF881, 882, 884, 885, 887, 888, 890, 891, 893, 894, 896–899, 900, 902, 903, 905, 906, 908, 909, 911, 912, 914, 915, 917, 918, 920, 921	(33) (29)	d 19/2 – 11/4/42	(84)	62			HF828, 838, 850, 854, 857, 860, 863, 866, 869, 883, 886, 889, 892, 895, 901, 904, 907, 910, 913, 916, 919, 922 converted on line to Mk.VIII
		25th prod. order 15th prod. batch VAL Weybridge	HX364–371, 373, 374, 375, 377, 378, 380, 382, 384, 385, 387, 389, 390, 392, 393, 395, 397, 399, 400, 402 (27) HX417, 421, 423, 425, 429, 431, 433, 435, 438, 440, 442, 446, 447, 449, 451 (15) HX468, 470, 472, 475, 478, 480, 483, 484, 486, 488 (10) HX506, 508, 510, 514, 516, 518, 521, 523, 525, 527, 529, 533, 535 (13) HX558, 560, 564, 567, 569, 571, 573, 577, 580, 583, 585, 589, 591, 594, 597, 601, 603, 606 (18) HX627, 631, 633, 635, 637, 639, 643, 645, 648, 651, 655 (11) HX670, 673, 676, 680, 682, 685, 688 (7) HX710, 712, 714, 716, 718, 722, 724, 727, 730, 734, 736, 739, 742, 748, 746, 750 (16) HX767, 769, 773, 775, 778, 781, 785 (7)		d 12/4 – 18/9/42	(300)	124				remaining 176 a/c built as Mk.VIII
		27th prod. order 16th prod. batch VAL Weybridge	LA865, 868, 873, 878, 884, 888, 894 LB110, 115, 120, 128, 131, 141, 148, 152 LB174	(7) (8) (1)	d 19/9/42 – 10/42	(150)	16			remaining 134 a/c built as Mk.VIII
SUBTOTAL							2,585			
Wellington Mk.II	298	prototype, VAL	L4250	(1)	ff 3/3/39		1	RAF, RCAF,	A&AEE, RAE, 9, 12,	interim prototype, conv. from Mk.I, later modified to Type 416 with dorsal turret for 40mm Vickers gun
	406	prototype, VAL VAL Weybridge	R3221 T2545	(1) (1)	d 5/40 d 7/40		1 1	FAA	38, 57, 99, 104, 142,	R3221, T2545 modified from Mk.IC
		9th prod. order 6th prod. batch VAL Weybridge	W5353–5401 (49) W5414–5463 (50) W5476–5500 (25) W5513–5537 (25) W5550–5598 (49) W5611 (1)		whole prod. batch d 7/10/40 – 4/5/41	(300)	199		148, 149, 158, 214, 218, 305,	remaining 101 a/c built as 74 Mk.IC and 27 Mk.VIII; W5389 (Type 470) withW2B, W5518/G (Type 488) with W2/700; W5389, 5399, 5400 mod. to Type 423
		13th prod. order 8th prod. batch VAL Weybridge	Z8328–8377 (50) Z8397–8441 (45) Z8489–8538 (50) Z8567–8601 (35) Z8643–8682 (20)		d 14/7/41 – 30/8/42	200	200		405; 778, 783 NAS; 8, 33 MU	Z8416/G (Type 439) fitted with 40mm 'S' gun in nose, Z8570/G (Type 445) fitted with BTH W2B jet in tail
SUBTOTAL							401	1		
Wellington Mk.IV	410	prototype, VAL	R1220	(1)	ff 12/40	(550)	1	RAF,	A&AEE;	built within original 6th order for 550 Mk.IC
	424	6th prod. order 3rd prod. batch V-A Chester	R1390, 1490, 1510, 1515, 1520, 1525, 1530, 1535, 1585, 1590, 1610, 1615, 1620, 1625, 1650, 1655, 1695, 1705, 1715, 1725, 1765, 1775, 1785, 1795	(24)	whole prod. batch 22/8/40 – 6/41	(550)	24	RAAF	142, 300, 301, 305, 458, 460;	built within original 6th order for 550 Mk.IC; R1515 A&AEE, 2/41; R1625 navigation tests A&AEE, 12/41
		12th prod. order 4th prod. batch V-A Chester	Z1182–1183 (2) Z1202–1221 (20) Z1243–1292 (50) Z1311–1345 (35) Z1375–1424 (50) Z1459–1496 (38)		whole prod. batch d 10/5/41 – 28/5/42	(710)	195		544 PRU	built within original 12th order for 710 Mk.IC, remaining 515 a/c built as 378 Mk.IC and 137 Mk.III; Z1244 ASR equip. trials, Z1248 → A&AEE propeller trials; some a/c for night PR experiments, 1942
SUBTOTAL							220			
TOTAL Mks.I, IA, IC, II & IV							3,577	1		B.9/32 prototype included

Designation	Type No.	Production, manufacturer	Serial number (s/n) and quantity	First flight (ff) / delivery (d)/built (b)	Qty. ordered	Qty. built	Qty. conv.	User	Unit / Institute	Note
Wellington Mk.III	299	prototype, VAL	L4251 (1)	ff 19/5/39		1	1	RAF,	A&AEE,	interim prototype, conv. from Mk.I, FN20A inst. 3/40
	417	prototype, VAL	P9238 (1)	ff 1/41		1		RCAF	RAE:	modified from Mk.IC, tropical air intake & filter trials
		11th prod. order 1st prod. batch V-A Blackpool	X3222-3226 (5) X3275-3289 (15) X3304-3313 (10) X3330-3374 (45) X3387-3426 (40) X3445-3489 (45) X3538-3587 (30) X3594-3608 (25) X3633-3677 (45) X3694-3728 (35) X3741-3765 (25) X3774-3823 (40) X3866-3890 (25) X3923-3967 (45) X3984-4003 (20)	whole prod. batch d 8/8/40 – 6/7/42	(500)	450		RAAF	9, 12, 37, 38, 40, 57, 70, 75, 99, 101, 115, 142, 150,	built within original 11th order for 500 Mk.IC; X3374 and X3595 conv. to Type 440 Mk.X prototypes, X3595 Type 440 Mk.X development, X3224 → RAE engine cooling tests; X3286 first conv. to TT, 1942; X3396 gun turret trials; X3635 later conv. to C Mk.XVI
		12th prod. order 4th prod. batch V-A Chester	Z1562-1578 (17) Z1592-1628 (35) Z1648-1697 (50) Z1717-1751 (35)	whole prod. batch d 10/5/41 – 28/5/42	(710)	137			156, 162, 166, 192, 196, 199,	built within original 12th order for 710 Mk.IC; remaining 573 a/c built as 378 Mk.IC and 195 Mk.IV
		17th prod. order 5th prod. batch V-A Chester	BJ581–625 (45) BJ842–875 (34) BJ886–730 (43) BJ753–810 (58) BJ818–847 (30) BJ876–922 (47) BJ958–991 (34) BK123–166 (44) BK179–214 (36) BK234–261 (48) BK295–315 (21) BK330–358 (29) BK385–408 (24) BK425–471 (47) BK489–517 (29) BK534–564 (31)	d 30/5 – 2/12/42	600	600			300, 304, 419, 420, 424, 425, 426, 427, 428, 429, 458, 466;	BJ895 experiments with Dambuster bombs; BK451 Dunlop Compacta tyre tests autumn 1945; BK537 (Type 451) Rotol airscrew tests
		18th prod. order 2nd prod. batch V-A Blackpool	DF543–579 (37) DF584–608, 610–642 (48) DF664–685, 687–700, 702–709 (44) DF727–729, 731–739, 741–743 (15)	whole prod. batch d 5/8 – 25/9/42	(400)	144			11, 12, 14, 15, 16, 17, 19, 20, 21,	remaining 6 a/c built as Mk.X, rest of order cancelled (250 a/c); DF627 special navigation equipment tests
		23rd prod. order 3rd prod. batch V-A Blackpool	HF609–613, 615–621, 623–625, 627–629, 631–633, 635–637, 639–641, 643–645, 647–649 (33) HF666–668, 670–703 (37) HF718, 719, 721, 722, 724, 725–728, 730, 731, 733, 734, 736–738, 740–742, 744–746, 748–750, 752–754, 756–758, 760–762, 764 (34) HF791, 792 , 794– 796, 798–802, 805, 807, 809, 810, 812–816 (19)	whole prod. batch d 25/9/42 – 3/2/43	(162)	123			22, 23, 24, 26, 27, 28, 29, 30, 82, 83 OTU; 1 BDU; 1473 Flt;	built within original 23rd order for 162 a/c, remaining 39 a/c built as 27 Mk.X and 3 Mk.XI, rest of order cancelled (9 a/c); HF616, 621 high altitude tests with Hercules 38
		26th prod. order 4th prod. batch V-A Blackpool	HZ103, 104, 106, 107, 109, 110, 112, 113, 115, 116, 118, 119, 121, 122, 124, 125, 127, 128, 130, 131, 133, 134, 136, 137, 139, 140, 145, 146, 148, 149, 150 (31) HZ173, 174, 176, 177, 179, 180, 182, 183, 185, 186, 188, 189, 191, 192, 194, 195, 197, 198, 200, 201, 203, 204, 206, 207, 209 (25) HZ242, 244, 245, 247, 248, 250 (8)	whole prod. batch d 20/12/42 – 11/43	(850)	82				built within original 26th order for 850 a/c, remaining 768 a/c built as 301 Mk.X, 72 Mk.XI and 415 Mk.XIII
SUBTOTAL						1,517	1			
Wellington B Mk.X	440	prototype, V-A	X3374, 3595 (2)	early 1942			2	RAF,	A&AEE,	converted from Mk.III, X3374 trials a/c
	448	18th prod. order 2nd prod. batch V-A Blackpool	DF542, 609, 686, 701, 730, 740 (6)	whole prod. batch d 5/8 – 25/9/42	(400)	6		RCAF, RAAF, FAA,	RAE; 36, 37, 38, 40, 70, 99,	built within original 18th order for 400 Mk.III, remaining 144 a/c built as Mk.III, rest of order cancelled (250 a/c); DF609 trials a/c
		22nd prod. order 7th prod. batch V-A Chester	HE147–184 (38) HE197–244 (48) HE258–306 (49) HE318–353 (36) HE365–398 (34) HE410–447 (38) HE459–506 (50) HE513–556 (44) HE568–615 (48) HE627–657 (41) HE679–715 (37) HE727–772 (46) HE784–833 (50) HE845–873 (29) HE895–931 (34) HE948–995 (50) HF452–495 (44) HF513–545 (33) HF567–605 (40)	d 11/42 – 7/6/43	(1,124)	789		FFAF, FAF	104,142, 150, 162, 166, 192, 196, 199, 215, 300, 304, 305, 407, 420,	built within original 22nd order for 1,124 Mk.IC; remaining 335 a/c built as 85 Mk.IC, 8 Mk.XII and 242 Mk.XIV; HE442 test-bed for air photography equipment and techniques, RAE, HE446, 574 rudder and elevator modification trials a/c A&AEE; HE497, 736 armament trials A&AEE, 1943
		23rd prod. order 3rd prod. batch V-A Blackpool	HF614, 622, 626, 630, 634, 638, 642, 646, 650 (9) HF669 (1) HF723, 725, 729, 732, 735, 739, 743, 747, 751, 755, 759, 763 (12) HF793, 797, 801, 805, 808, 811 (6)	whole prod. batch d 25/9/42 – 3/2/43	(162)	27			424, 425, 426, 427, 428, 429,	built within original 23rd order for 162 a/c, remaining 135 a/c built as 123 Mk.III and 3 Mk.XI, rest of order cancelled (9 a/c)
		26th prod. order 4th prod. batch V-A Blackpool	HZ102, 105, 108, 111, 114, 117, 120, 123, 126, 129, 132, 135, 138, 141, 144, 147 (16) HZ175, 181, 187, 193, 199, 205 (6) HZ243, 249, 255–273, 277–282 (27) HZ300–305, 309–314 (12) HZ353–358, 362–367, 371–376 (18) HZ386–403, 410–415, 422–427, 434–439 (24) HZ467–487(21) HZ513–521, 528–533, 540–545, 552–554 (24) HZ570–572, 579–582 (7) HZ713–720 (8) HZ809–818 (10) HZ941–950 (10) JA111–140 (30) JA185–194(10) JA341–352 (12) JA448–481 (34) JA497–512, 519–534 (32)	whole prod. batch d 20/12/42 – 11/43	(850)	301			431, 432, 466, 527; 6, 10, 11, 12, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 77, 81,	built within original 26th order for 850 a/c, remaining 549 a/c built as 62 Mk.III, 72 Mk.XI and 415 Mk.XIII
		28th prod. order 8th prod. batch V-A Chester	LN157–189 (33) LN221–248 (28) LN261–303 (43) LN317–353 (37) LN369–409 (41) LN423–458 (36) LN451–516 (36) LN529–571 (43) LN583–622 (40) LN633–676 (44) LN689–723 (35) LN736–778 (43) LN791–823 (33) LN836–879 (44) LN893–936 (44) LN945–989 (42) LP113–156 (44) LP169–213 (45) LP226–268 (43) LP281–314 (34) LP325–369 (45) LP381–415 (35) LP428–469 (42) LP483–526 (44) LP539–581 (43) LP595–628 (34) LP640–686 (47) LP699–733 (35) LP748–788 (41) LP802–849 (48) LP863–889 (27) LP901–930 (30) LP943–986 (44) LR110–142 (33) LR158–184 (0) LR188–183 (16) LR195–210 (15)	d 15/9/43 – 18/1/45	1,374	1,374**			82, 83, 84, 85, 86, 105 OTU; 202 CTU; 1380, 1381 TSCU; 18, 48 MU; 1473 Flt.; 755 NAS; CNS	** some sources state 1,382 a/c built, but this quantity does not correspond to serial numbers LN715 (Type 602) Dart turboprop tests LN718 (Type 478) with Hercules 100, trials a/c LN374 to French AF post-war LN622 test-bed for air photography equipment and techniques, RAE
		29th prod. order 5th prod. batch V-A Blackpool	MS870–883 (14) ME951–960 (10) ME972–999 (28) MF113–124, 131–144 (26) MF163–202 (10) MF236–249 (14) MF281–288, 311–315 (14) MF346–351, 357–372 (12) MF399–404, 421–424 (10) MF439–441, 452–459, 468–479 (23) MF500–538 (39) MF550–572, 583–598 (37) MF614, 615, 624–633, 644–655 (26) MF675–687, 695–706 (24) MF725–739 (12)	d 10/12/43 – 6/44	(600)	299				remaining 301 a/c built as 297 Mk.XIII and 4 Mk.XIV ME871 to Free French Air Force early 1945
		31st prod. order 6th prod. batch V-A Blackpool	MS470–496 (27)	d 3/2 – 4/4/43	27	27				
		32nd prod. order 9th prod. batch V-A Chester	NA710–754 (45) NA788–811 (46) NA823–870 (48) NA893–937 (45) NA949–997 (49) NB110–139 (30)	d 2/8/44 – 5/7/45	(750)	283				rest of order cancelled (467 a/c); NA724 trials a/c for unarmed training version, 7/45
		34th prod. order 7th prod. batch V-A Blackpool	NC421–432, 443–452 (22) NC472–481, 494–502, 514–517 (23) NC529–533, 545–554, 563–570 (23) NC592–601, 614–621 (18) NC648–655, 664–671, 678–692 (31) NC706–740, 748–750 (38) NC786–770, 777–784, 789–795, 801–813 (34) NC825–827, 836–847, 856–857 (27) NC890–901, 908–925, 929 (31) NC942–990 (49)	d 6/44 – 10/44	(500)	298				remaining 204 a/c built as 90 Mk.XIII, 84 Mk.XIV and 30 Mk.XVIII
		35th prod. order 8th prod. batch V-A Blackpool	PF823–830, 839–848, 855–862 (24) PF883–888, 894–901, 912–915 (18) PF927–930, 941–948, 959–998 (20) PF987–994 (8) PG117–124, 135–138, 149–152 (16) PG175–182, 193–196, 207–210 (16) PG232–235, 250–253, 258–265 (16) PG286–297, 304–328 (35) PG336–346, 357–366, 371–378 (30) PG392–394, 401–422 (25)	d 11/44 – 4/45	(400)	208				remaining 192 a/c built as 162 Mk.XIV and 30 Mk.XVIII; PG181, 290, 291, 315 to French AF in 1946
		36th prod. order 9th prod. batch V-A Blackpool	RP312–329, 336–347, 352–358 (37) RP373–391, 386–411 (26) RP430–469 (40) RP483–526 (44) RP538–561 (24) RP565–590 (26)	d 7/5/45 – 25/10/45	(600)	208				another 20 a/c built as Mk.XVIII, rest of order cancelled (374 a/c); RP468 with tail boom radar, as G-ALUH 22/7/49; RP484 noise tests with Bristol
SUBTOTAL						3,796	2			
Wellington T Mk.X/ T Mk.10	619	conversion	e.g. LN715, LP595, 597, 605, 606, MF629, 628, NA928, NC425, 892, PG262, 312, 314, 317, 287, RP389, 569, 589, 590	converted 1/46 – 3/52			270	RAF	201, 202 AFS, CGS; 1, 2, 5, 6, 7, 10 ANS	conversion by Boulton Paul
Wellington T Mk.XIX/ T Mk.19	—	conversion	e.g. LR132, NA851, NC750, RP505, 550				*			post-war service conversion of B Mk.X, later modified to T Mk.10 standard
SUBTOTAL							270*			
TOTAL Mks.III, X, T Mk.X/10 & T Mk.XIX/19						5,313	273*			* total number of converted a/c unknown
GRAND TOTAL Mks.I, IA, IC, II, III, IV, X, T Mk.X/10 & T Mk.XIX/19						8,990				B.9/32 prototype included

Wellington engines

Bristol Pegasus XVIII

Diameter/length	49.5"/61.0" (1,260/1,550 mm)
Continuous power	815 hp (608 kW)
Power rating, take-off	2,475 rpm
Dry weight	1,135 lb (515 kg)
Fuel grade (DTD Specification)	87 Octane value (DTD 230)
Fuel consumption	198 gal/hr (900 l h^{-1})

Bristol Hercules III/XI/VI/XVI

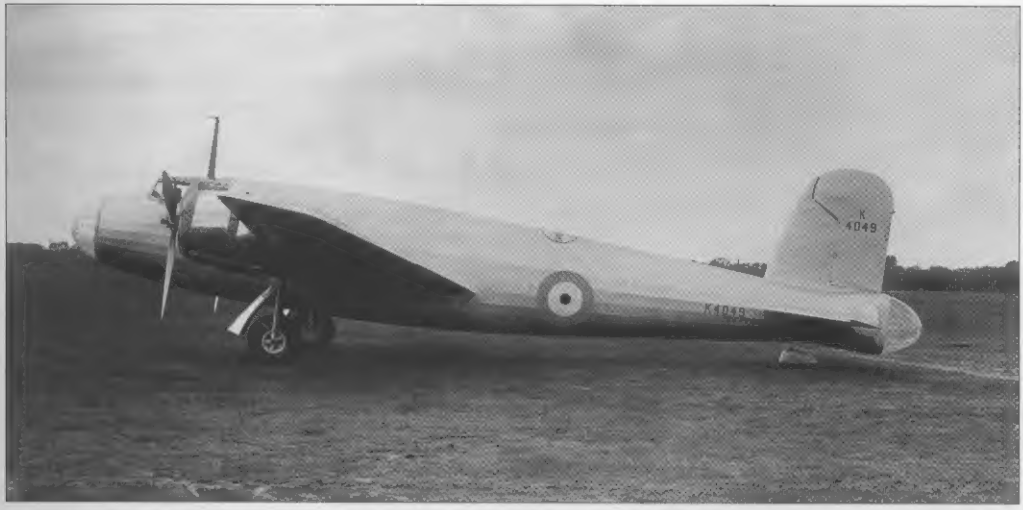
Diameter/length		52.0"/67.5" (1,320/1,715 mm)
Continuous power	- Hercules III/XI/VI & XVI	1,400/1,590/1,615 hp (1,044/1,186/1,205 kW)
Power rating, take-off	- Hercules III/XI/VI / XVI	2,800/2,900/2,800/2,900 rpm
Dry weight	- Hercules III/XI/VI & XVI	1,850/1,885 lb (840/855 kg)
Fuel grade	- Hercules III/XI/VI & XVI	87 or 100/100/87 or 100 Octane value
Fuel consumption, rich mixture, at 2,800 rpm		
	- Hercules XI/VI & XVI	290/320 gal/hr (1,318/1,455 l h^{-1})

Pratt & Whitney R-1830-S3C4-G Twin Wasp

Diameter/length	48.2"/61.2" (1,225/1,555 mm)
Continuous power	1,050 hp (783 kW)
Power rating, take-off/diving	2,700/3,060 rpm
Dry weight	1,460 lb (665 kg)
Fuel grade	100 or 125 Octane value
Fuel consumption, rich mixture, at 2,550 rpm	210 gal/hr (955 l h^{-1})

Rolls-Royce Merlin X

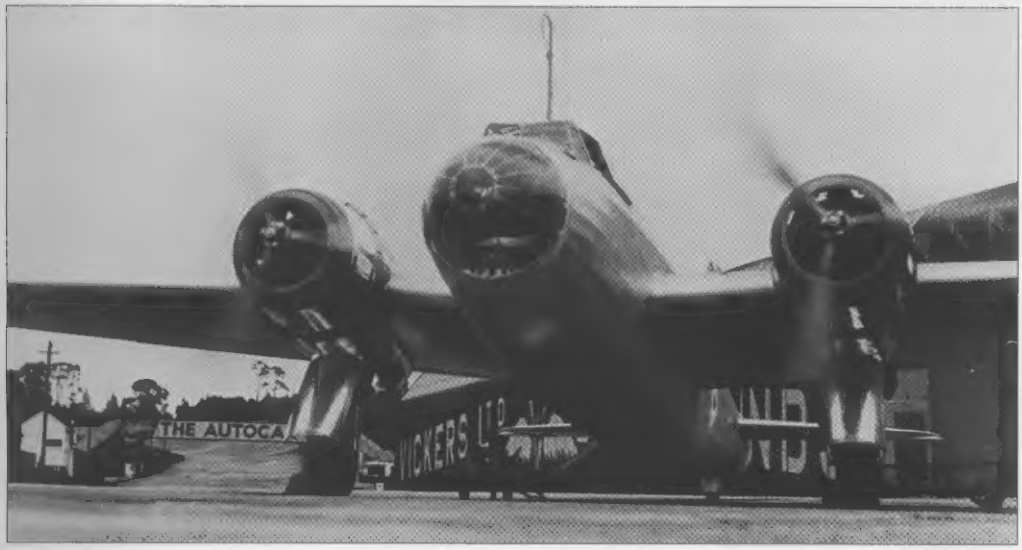
Length/width/height	71.0"/29.8"/43.0" (1,800/760/1,090 mm)
Continuous power	1,145 hp (854 kW)
Power rating, take-off/diving	3,000/3,600 rpm
Dry weight	1,450 lb (660 kg)
Fuel grade	87 or 100 Octane value
Fuel consumption, rich mixture, at 2,600 rpm	
- climbing/cruising	160/142 gal/hr (727/646 l h^{-1})



The Vickers B.9/32 was the progenitor of numerous Wellington aeroplanes. Seen at Brooklands shortly after the maiden flight in June 1936, it displays its original configuration with cupola-type turrets and "waisting" in the rear fuselage.

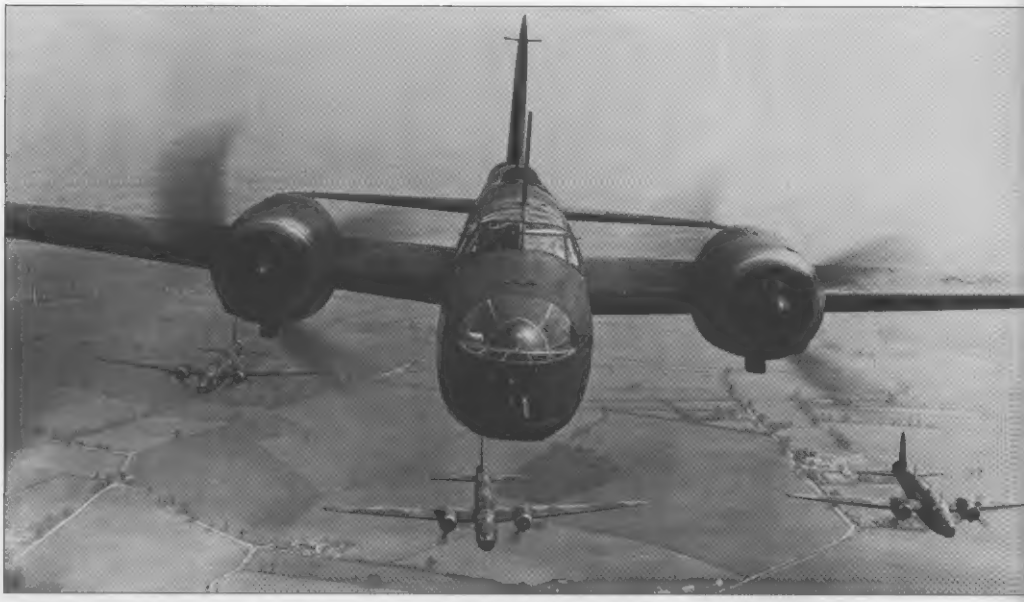
Another view of the prototype, K4049, ready for the Hendon Air Display on 6th June 1936. New Types Park number "7" is yet to be applied to the nose. Note that the glass canopies of the nose and tail are faired over to prevent inspection of the interior (right).

The B.9/32 was regarded as the most advanced design of its day. Below, engines are being warmed-up in front of the Vickers hangar at Brooklands. The tilted motor racing track can be seen in the background.



Brooklands Museum Trust Ltd. 1961/64

IWM, C93



The A.J. Jackson Collection

The spacious Vickers-designed front gun turret is prominent in this head-on view of the Mark I.

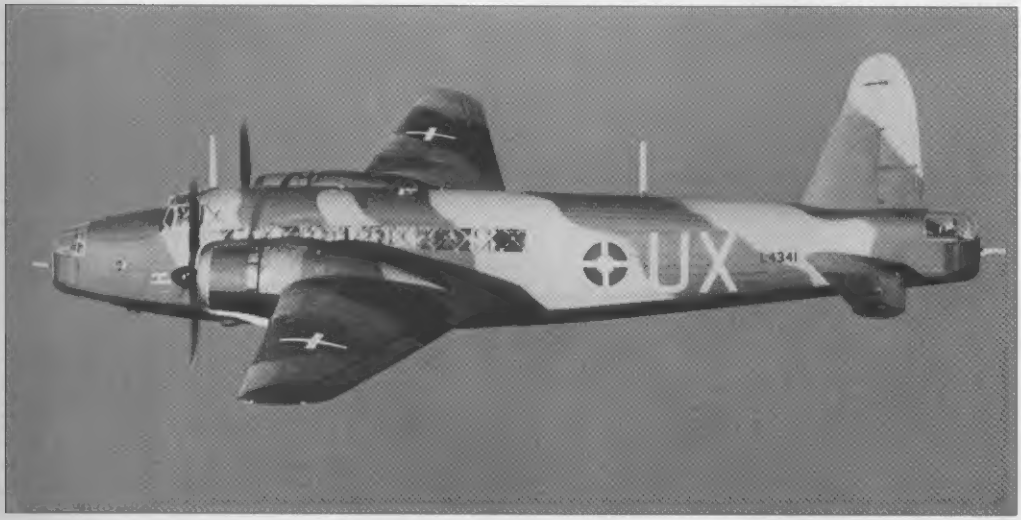
A Type 285 Wellington Mk.I prototype, L4212, is towed back to the hangar after completing a test flight in the early spring of 1938 (left).

The 'F' code letters of No.37 Sq. are not yet applied to this Mk.I, L4332/P, seen here in mid-1939. Note the wind deflector screen of the open observation hatch and small Type B roundels on the wing tops.

Brooklands Museum Trust Ltd., 1941/308 (5162)

A "Sock" of Wellington Mk.Is belonging to No.9 Sq, RAF based at Stradishall, Suffolk, during the spring of 1939. Aircraft of this unit took part in the 2nd International Salon of Aeronautics at Brussels in July that year. Flying nearest the camera are the 'L4261/KA-B' and 'L4274/KA-K', with early twin aerial masts, long cabin windows and the observer's sliding hatch. Modified Type B roundels are carried both on the fuselage and above the wings.

IWM.CH17

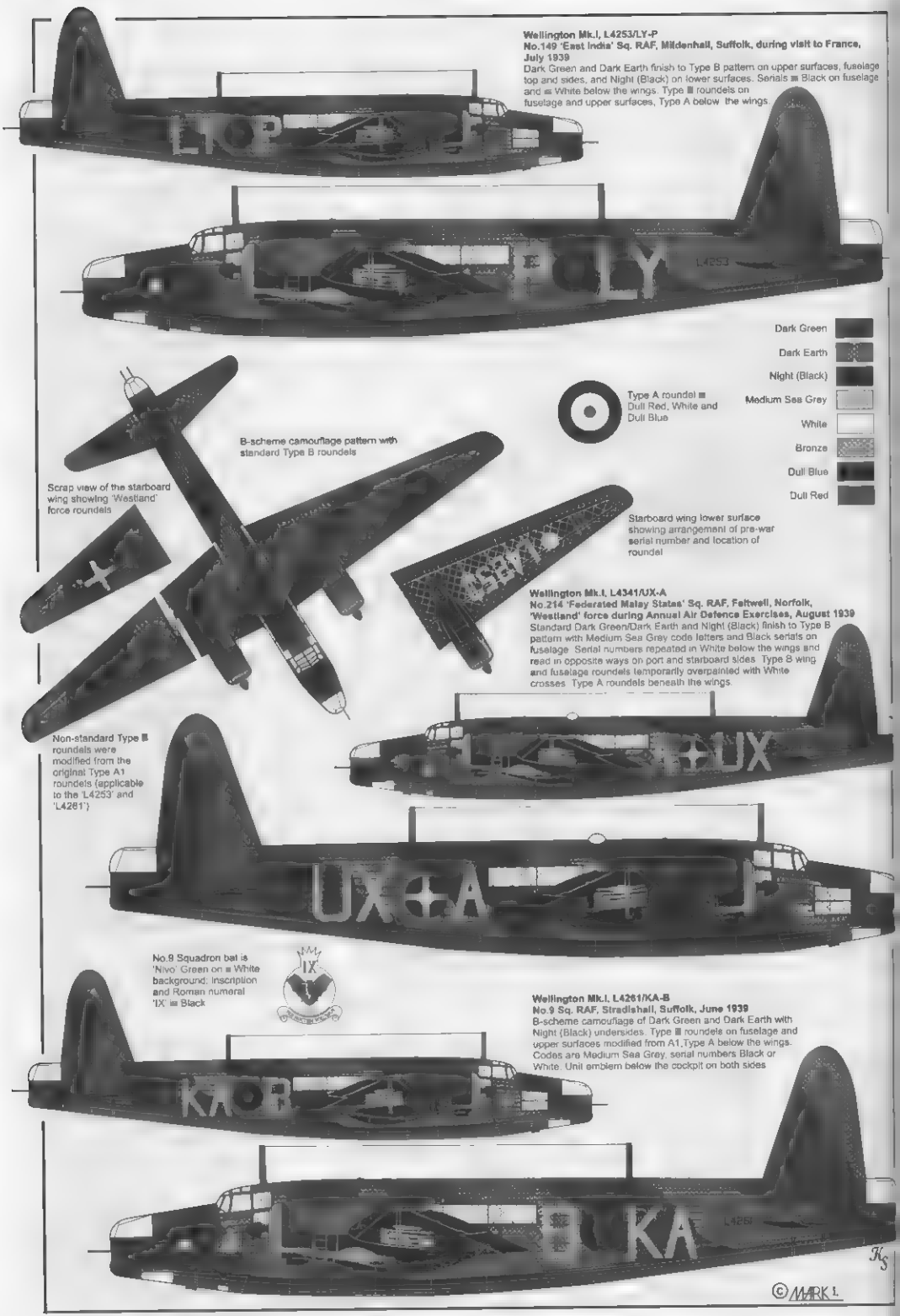


Brooklands Museum Trust Ltd., FSB/134

This Mk.I carries exercise marking of the 'Westland' force aircraft, with White crosses painted over the roundels. The 'L4341/UX-A' was on the strength of No.214 Squadron in August 1939. Unlike the aircraft in the heading photo, this Wellington has a new transparent astrodome in the fuselage roof, although the D/F loop is not yet fitted. A propeller warning notice is painted just below the cockpit.

Brooklands Museum Trust Ltd.

A bird's eye view of an early Mark Wellington shows to advantage its high aspect ratio wing of 86 ft 2 in span and narrow chord tailplanes. Note how the underpressure effecting on the fabric-covered wing reveals the geodetic structure. The aircraft wears a Type A camouflage pattern, associated with the even serial number of the machine, and Yellow outlined Type A1 roundels on the wing upper surfaces.



Wellington Mk.I, L4253/LY-P
No.149 'East India' Sq. RAF, Mildenhall, Suffolk, during visit to France, July 1939
Dark Green and Dark Earth finish to Type B pattern on upper surfaces, fuselage top and sides, and Night (Black) on lower surfaces. Serials Black on fuselage and White below the wings. Type B roundels on fuselage and upper surfaces, Type A below the wings.

Wellington Mk.I, L4341/UX-A
No.214 'Federated Malay States' Sq. RAF, Feltwell, Norfolk, 'Westland' force during Annual Air Defence Exercises, August 1939
Standard Dark Green/Dark Earth and Night (Black) finish to Type B pattern with Medium Sea Grey code letters and Black serials on fuselage. Serial numbers repeated in White below the wings and read in opposite ways on port and starboard sides. Type B wing and fuselage roundels temporarily overpainted with White crosses. Type A roundels beneath the wings.

Wellington Mk.I, L4261/KA-B
No.9 Sq. RAF, Stradishall, Suffolk, June 1939
B-scheme camouflage of Dark Green and Dark Earth with Night (Black) undersides. Type B roundels on fuselage and upper surfaces modified from A1,Type A below the wings. Codes are Medium Sea Grey, serial numbers Black or White. Unit emblem below the cockpit on both sides

As the Pegasus engines roar, the last crew members are boarding their Wellington Mk.IA, P9210, some time in the summer of 1940. At that time the aeroplane was with No.75 Squadron, manned by New Zealanders, and shows the initial low demarcation line between upper and lower surface camouflage colours.

IWM, C1936

On 14 March 1940, these Mk.IA aircraft (the 'N3000' is the second from the left) were lined up ready for acceptance test flights. Note the de Havilland airscrews, with small spinners, and the short exhaust pipes fitted only to the starboard engines (below).

Mike Hooks

IWM, HU44865

'OJ'-coded Wellington Mk.ICs, belonging to No.149 Sq. at Mildenhall. The aircraft nearest the camera is the 'P9273/OJ-N', which failed to return from a raid on Ostend on 8/9 September 1940. Both aeroplanes are fitted with the under-turret and have their Black camouflage extended up the fuselage sides. The farthest machine still retains earlier scheme colours of Dark Green and Dark Earth on its rudder but has the new form of fin flash already applied.

IWM, CH730

No.215 Sq. Wellington Mk.IAs being readied at Bassingbourn air station, where the squadron moved on [illegible] May 1940. Non-standard fuselage roundels and fin stripes are present on the 'N3912/LG-G'.

A Wellington Mk.IA, P9226/KX-Z, of the sole Czechoslovak Bomber Squadron [illegible] serve in the UK during WWII, seen at East Wretham some time in the winter of 1940. Until July 1941 this aircraft was only used for training. Note that the White area of the roundel is overpainted in Black (right).

A Wellington Mk.IC, R1006/GR-H, of No.301 'Pomeranian' (Polish) Squadron based at Swinderby. 250lb bombs are being checked and fused by the armourers before bombing up. The aeroplane crashed on landing on 2 January 1941.

BBMF Collection

IWM: CH1268

A trio of 'KX'-coded Mk.ICs of No.311 (Czechoslovak) Squadron flying side by side on a daylight mission in March 1941, including the 'R1410/M', the 'R1378/K' and the 'T2561/A'. The upper/lower camouflage demarcation line, in the form of small "scallops", is set high on the fuselage sides, while the vertical tail surfaces are painted in Black. Note that the '[redacted]-A', previously serving as a training machine, is not fitted with a di-pole antenna below the rear fuselage.

RAAF Collection

Wearing what appears to be a Type B camouflage scheme, this 'P9249' was built in early 1940 within a production order of mixed Mk.IA and IC aircraft. It went [redacted] No.38 Sq. as 'HD-T' but crashed on approach at Marham on 16 June that year. Although a Mark IC, the aircraft shares the earlier installation of the front gun turret of smaller traverse and is not yet fitted with the Lorenz Blind Approach antenna (above). The 'NZ-A', a Mk.IC, was on the strength of No.304 'Mazovia' (Polish) Squadron, which operated the type from November 1940 to April 1943 (above right).

IWM: CM365

The low sun and clear sky of the Western Desert adds to this pre-flight scene, with a Wellington Mk.IC, T2508/LF-O of No.37 Sq. as the centrepiece. The location is Shallufa airfield, Egypt, [redacted] January 1941. The distinctive nose art carried on the port side below the cockpit was the personal insignia of its pilot, F/Lt Lemon. See [redacted] 36 for nose art details.

Brooklands Museum Trust Ltd., F/28/17

Vladimir Sochy collection

With an appropriate emblem of the Welsh dragon below the cockpit, a Mk.IC, R1333, flies for the camera on 7 November 1940. The aeroplane, named "The Broughton Wellington" after the Chester Works airfield in North Wales, was made available to the RAF by the company workforce. Unfortunately it crashed on take-off a month later while serving with No.99 Squadron (a replacement aircraft, the 'R1516', also bearing the same name, was delivered in March 1941 to No.311 Sq. as the 'KX-U'). Note the "wavy" colour boundary line on the wing and tailplane leading edges, and half-way up the fuselage (above).

Parked at the dispersal at East Wretham, Norfolk, a Czechoslovak "Wimpy", the 'R1598/KX-C' of No.311 Sq., is about to be refuelled from a browser. The aeroplane was with the unit from March 1941 to February 1942 and performed a total of 51 operational missions. Note the starboard "barbed" exhaust pipe (left).

The fuselage of a veteran Wellington Mk.IC, R3224, formerly with Nos.75 and 37 Squadrons, anchored on an RAF 'Queen Mary' semitrailer, awaits transport to the repair shop (left). Wheels-up landing of the 'R1090/ED-K' of No.21 OTU at Moreton-in-Marsh. The aeroplane would be hoisted using inflatable bags below the wings to allow the transport carts to be pushed under the engine nacelles (right).

Jaroslav Popelka

Alan Koukol collection

Jaroslav Popelka

A Mk.IC, Z1111/KX-N, was the first aeroplane within the 311th squadron to receive the new "coastal" colours in September 1942. Later it went to No.7 OTU, ending its career in January 1944 (above left). From January 1943 the code letters were removed from the fuselage sides, leaving only an individual aircraft letter. The 'Z1147/Q' was pictured in April 1943 during an anti-submarine chase over the Atlantic (above).

Talbenny air base, located on the coast of St Bride's Bay, Pembrokeshire, was the home of the 311th (Czechoslovak) Squadron from June 1942 to May 1943, serving under the RAF Coastal Command. The Wellingtons adopted Temperate Sea Scheme colours with White lower surfaces. Both "scalloped" and straight demarcation lines between upper and lower surfaces were applied. Late production Mk.ICs are depicted, with trapezoidal beam station windows installed. The 'R1600' was coded 'T' within the squadron and later it was converted to C Mk.XVI standard. The 'DV474/Y' is parked in the background.

Jaroslav Popelka

With its wheels chocked and the Pegasus engines warming up, another Wellington of No.311 Squadron finishes preparations for take-off at Talbenny in the spring of 1943. In this instance the nose turret contains no guns. The two "dashes" seen on the port wing leading edge are in fact the heating system air intakes.

IWM, CH5027

A nice shot of an early production Wellington Mk.II, W5379. The installation of an alternative in-line powerplant, the Rolls-Royce Merlin, is clearly discernible in this view. Although a later Mark in the sequence, the Mk.II was preceded by Mk.IA and ICs in production. It had an increased tailplane chord to cure longitudinal instability, a feature that was also adopted by Mk.III and Mk.X aircraft. This aircraft was lost over Cologne on 11 October 1941 (above). No.405 'Vancouver' Sq. RCAF was the sole Canadian unit to operate the Mk.IIs between May 1941 and April 1942. One of their Wimpies, the 'W5515/LQ-Y', is pictured here at Driffield, East Yorkshire (below right).

BBMF Collection

A Polish Mk.II, W5590/SM-A, taking part in a parade at Lindholme, South Yorkshire, where No.305 Squadron was stationed in the spring of 1942 (left). A head-on view of the interim Mk.II prototype, the 38th Mk.I airframe. In this photo, taken in March 1939, it had the serial 'L4250' in white beneath the wings (below).

IWM, ATP10147A

Mike Hooks

Two shots of the 104th Squadron's Mk.II aircraft, the 'W5461/EP-R' and 'Z8345/EP-S'. Both aeroplanes were manufactured at Weybridge, but in different production batches; note the presence of the beam gun station and the windows partially blanked out on the aircraft in the photo on the left. The 'R' went missing in action over Berlin on 18 August 1941, while the 'S-for-Sugar' crashed on approach at LG121 airfield near Sidi Barrani in Egypt on 4 June 1942; the squadron moved to the Mediterranean from its Driffield base in October 1941 becoming No.158 Sq.

Two Wellingtons – a Mk.II, W5442/BU-V, and a Mk.IC, BU-Q – made available as a donation from the Federated Malay States. A tiger's head is painted under the cockpit of both aircraft, accompanied by the inscriptions 'SRI GURCH' and 'KUALA LUMPUR' on respective machines. This photo was taken at Stradishall in November 1941.

IWM, CH3944

Mike Hooks

Mike Hooks

The Wellington Mk.III was a substantial advance on the Mk.I, IA and IC versions in terms of performance and bomb-carrying capacity. The 'P9238' was the second machine to represent the new Mark, being modified from a Mk.IC on the production line at the beginning of 1941. It was fitted with Hercules III engines enclosed in a new type of cowling; the short carburettor air intake was a characteristic feature of the Mk.III version. This particular machine, seen here fitted with a mock-up of the rear FN20A 4-gun turret, was thoroughly tested at the A&AEE at Boscombe Down from May 1941 to October 1942 and later became the '3410M' instructional airframe (above and left).

The 'L4251', the first Hercules-powered prototype, was converted from a Mk.I and as such it retained the original two aerial masts, unfaired loop and longer cabin windows (below).

Brooklands Museum Trust Ltd.

Mike Hooks

Majesty in the skies. Two atmospheric in-flight studies of a Wellington Mk.III, X3763/KW-E, in the hands of the Canadian crew of No.425 'Alouette' Squadron. This aircraft was built at Blackpool and, re-coded as the 'KW-L', it failed to return from a night raid on Stuttgart on 14/15 April 1943. Close study of the photographs reveals the rare application, on the wings only, of a camouflage scheme with the colours transposed. Although a type B pattern is utilised, Dark Green (represented by darker areas) is in place of Dark Earth and vice versa. The non-standard camouflage scheme of this aircraft is the subject of a colour profile on ■ 45.

Mike Hooks

Above, not the best of photos but important as it shows a distinguishing feature of all Wellingtons (except some late Mk.Xs) – the different shapes of the exhaust pipes fitted to the port and starboard sides. This aircraft is the 'X3803/KW-H' of 425th Squadron. Rotol Electric constant-speed wooden propellers were fitted to all Mk.IIIs, as exemplified in the photo above right.

A group of No.30 OTU Wellingtons lined up at Hixon, Staffordshire, on 11 September 1943. The aircraft include Mk.IIIs, BK347/BT-Z, DF640/BT-T, KD-Y, BJ597/KD-W, KD-V, KD-X and KD-M, while in the background are B Mk.Xs, KD-Q and KD-D. The 'BT-Z' crashed at Whernside, Yorkshire, on 21 April 1944. The fuel browser bears the encircled number '230' indicating that 87 Octane fuel is used (right).

With the background retouched, this Mk.IV prototype, R1230, shows a different installation using American Twin Wasp engines. It is not yet up to production standard - the beam gun stations are missing and the older FN5A rear gun turret is fitted. Note the Yellow "prototype" undersides (below).

Brooklands Museum Trust Ltd. MT/1

Bearing a close external resemblance to its predecessor, the Wellington Mk.X was built in the largest numbers, with production spread out from mid-1942 to late 1945, and shared between the Blackpool and Chester plants. In the photo above, the 'X3595' represents the second prototype of the B Mk.X, fitted with more powerful Hercules VI engines and de Havilland Hydromatic propellers, one of three airscrew types used. Being converted from a Mk.III aircraft, it still wears the marking ('AA-K') of its former user, No.75 'New Zealand' Squadron, in May 1943.

IWM, CNA3705

The standard appearance of a Blackpool-built B Mk.X, HZ945, dated August 1943. The aeroplane passed through Nos.310 and 301 FTU and was eventually despatched for service in the Far East. It is armed with FN5A front and FN120 rear gun turrets and fitted with beam stations. The cabin windows and the pilot's starboard sidewall window are blanked out, while updated radio and IFF installations are employed (left). 'DF'-serialled B Mk.Xs (the 'DF542/X-G' nearest the camera), of No.205 Group, serving in Italy during the summer of 1943. Of note is the final design of the boundary between upper and lower camouflage colours on the fuselage side (right).

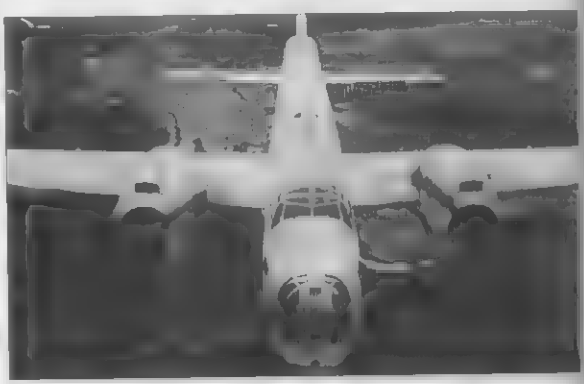
Jaroslav Popelka

A Wellington B Mk.X, HF898/BH-E, of No.300 'Masovian' (Polish) Sq. operating from Ingham, Lincolnshire, in 1943, awaits its parachute-retarded mines. Note the Rotol airscrews and spinners (left). The 'HE231/27' served with Czech Flight No.6 (Coastal) OTU at Silloth, Cumberland, during the spring and summer of 1943. The numeral '27' was Red outlined in White. Note the SBA antenna on the fuselage spine (above).

FAA Museum, YW4

A handful of Wellington Mk.Xs were used by the Fleet Air Arm. Among these was the 'NC826' whose 'L8F' code identifies it as a No.765 NAS machine. This aircraft was based mainly at Manston during its short squadron service career, lasting from March to September 1945, and it sports an unusual overall White scheme and Dark Slate Grey codes (above and below right).

FAA Museum, YW9



This Wellington B Mk.X, HZ470/B, was delivered to No.18 MU in September 1945. Retaining its war-time camouflage it served with No.765 Squadron and eventually crashed during take-off on 26 March 1946 at Hal Far on Malta (left).

When war ended a lack of crew trainers led to unit level modifications of the aircraft, known as the T Mk.XIX. These machines were later upgraded with more sophisticated navigational equipment and redesignated the T Mk.X, which was transcribed to Arabic T Mk.10 in mid-1947. The 'LR132/WG-Y' served with No.26 OTU; note the White underwing serials.

Post-war, about 270 B Mk.Xs were converted into training aeroplanes by Boulton Paul. One of those was the 'NA928', pictured in June 1949 at Hullavington, the base of No.1 Air Navigation School. It was struck off charge in December 1953.

Another T Mk.10 example, the 'NC892', on static display during a public air show in the late 1940s. Note that the nose turret is faired over while the rear turret has been retained (right).

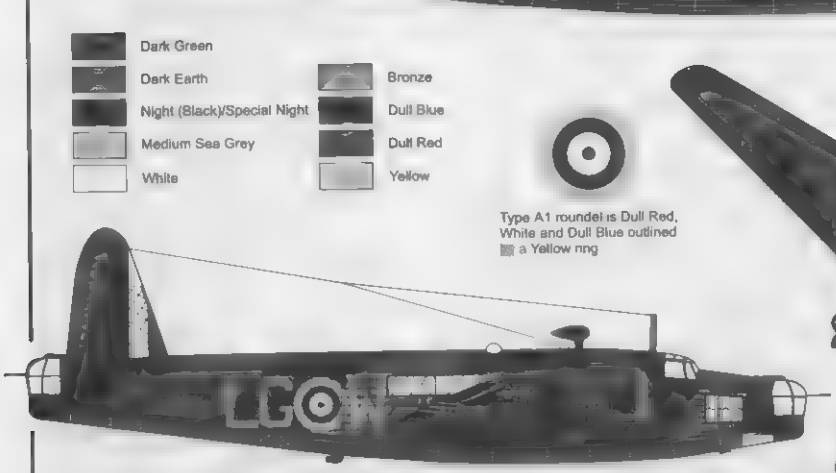
A T Mk.10, RP589, displays its post war camouflage and markings to good advantage. Yellow training bands were painted on the rear fuselage and around the wings. The Rebecca, TBA and IFF aerials are discernible below the fuselage, on the nose and on the fuselage spine.

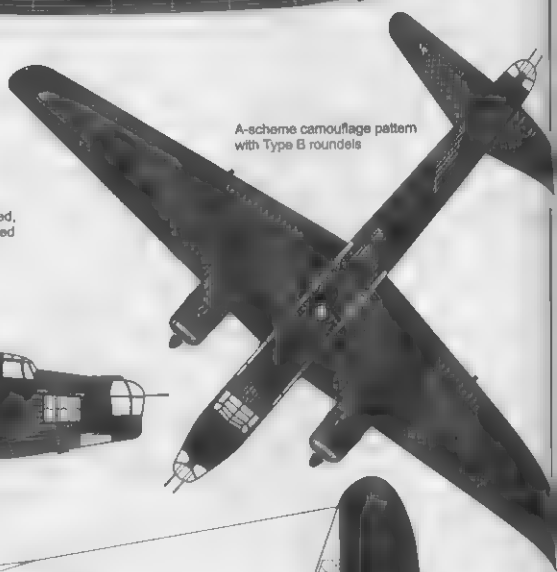
IWM A17713 10C

Wellington Mk.IA, L7786/WS-A
No.9 and No.311 (Czechoslovak) Sq. RAF, Honington, Suffolk, September/November 1940
Dark Green, Dark Earth upper surfaces to Type A pattern and Night (Black) undersurfaces, fuselage sides and vertical tail surfaces. Type B upperwing roundels, Type A underwing roundels and Type A1 roundels on fuselage. Codes and serials in Medium Sea Grey.

Dark Green
Dark Earth
Night (Black)/Special Night
Medium Sea Grey
White
Bronze
Dull Blue
Dull Red
Yellow

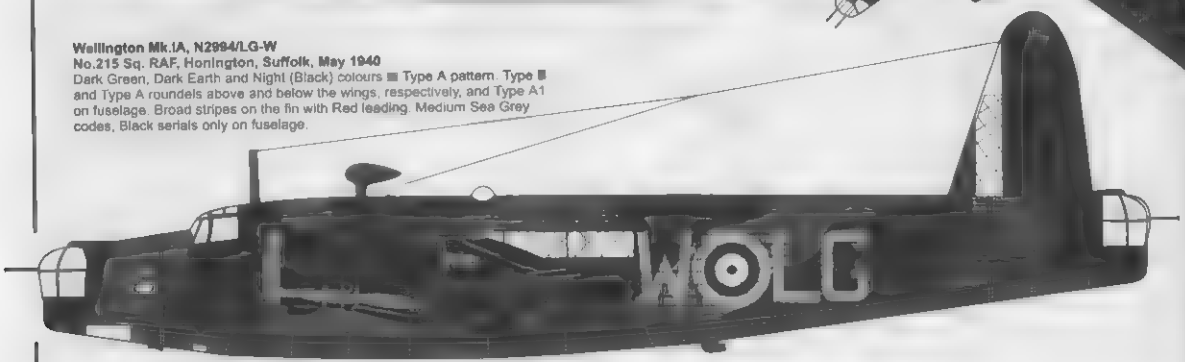
Type A1 roundel is Dull Red, White and Dull Blue outlined a Yellow ring



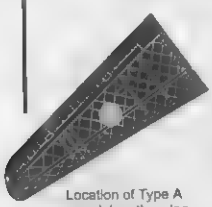


A-scheme camouflage pattern with Type B roundels

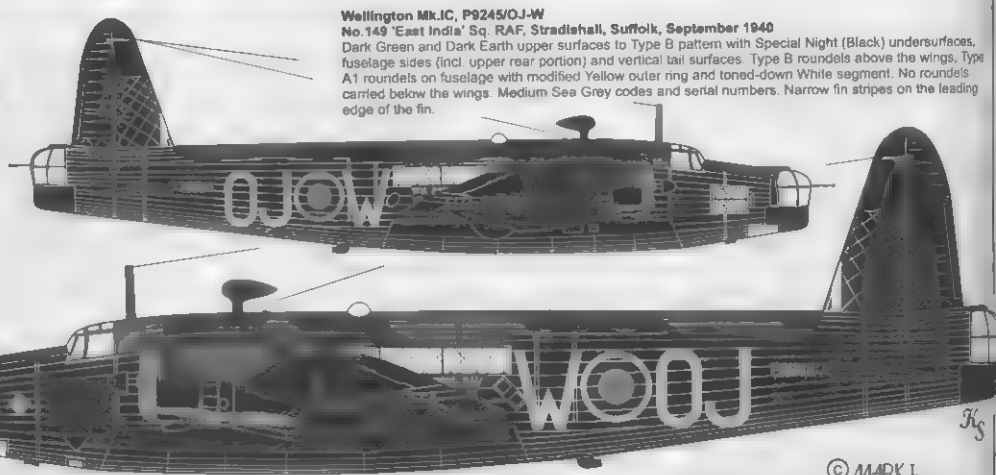
Wellington Mk.IA, N2994/LG-W
No.215 Sq. RAF, Honington, Suffolk, May 1940
Dark Green, Dark Earth and Night (Black) colours ■ Type A pattern. Type ■ and Type A roundels above and below the wings, respectively, and Type A1 on fuselage. Broad stripes on the fin with Red leading. Medium Sea Grey codes, Black serials only on fuselage.



Wellington Mk.IC, P9245/OJ-W
No.149 'East India' Sq. RAF, Stradishall, Suffolk, September 1940
Dark Green and Dark Earth upper surfaces to Type B pattern with Special Night (Black) undersurfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type B roundels above the wings, Type A1 roundels on fuselage with modified Yellow outer ring and toned-down White segment. No roundels carried below the wings. Medium Sea Grey codes and serial numbers. Narrow fin stripes on the leading edge of the fin.



Location of Type A roundel on the wing lower surface



A rather worn-out and gunless Mk.IA, N3887/5, posing for this in-flight shot on 24 June 1943. At that time the aircraft was used by the Central Gunnery School at Sutton Bridge, Lincolnshire. Later it was converted for transport duties by Vickers and redesignated the C.Mk.XV.

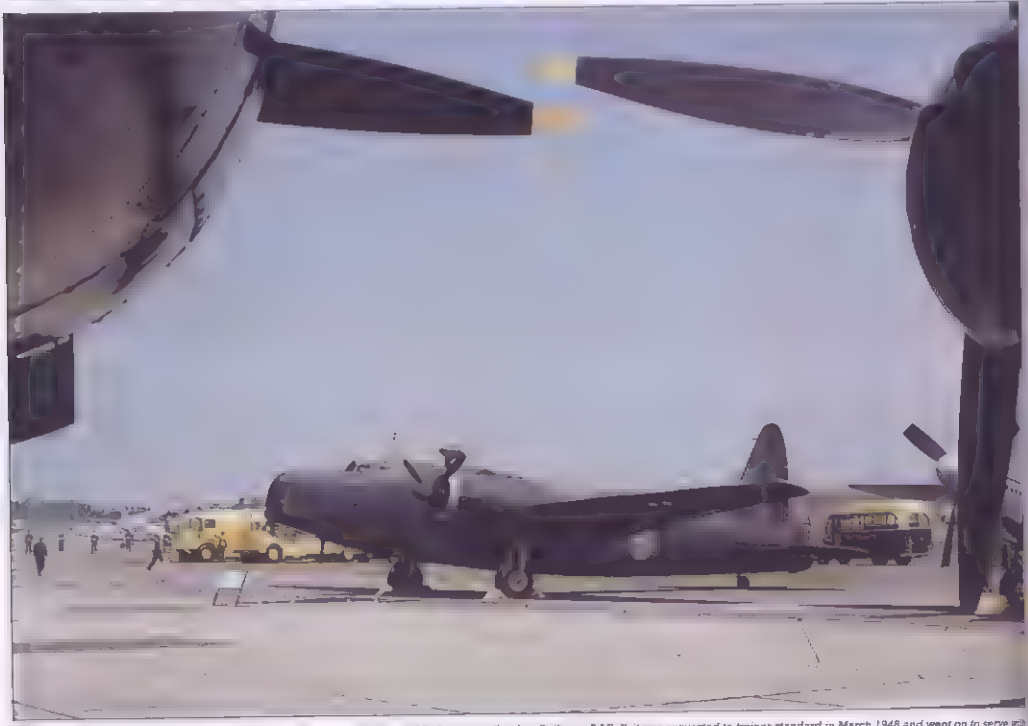
The extreme rarity of these colour shots of the Wellingtons serving with No.311 (Czechoslovak) Squadron at Talbenny makes up for their poor quality (photos above and below). After reallocation from Bomber to Coastal Command, the squadron's Mk.ICs retained their original Temperate Land Scheme for some time before being repainted with new colours. The photos were extracted from a unique short documentary filmed in September 1942 and depict the 'X9827/KX-F' (above left and below right) and the 'X3178/KX-P' (above right).

Another previously unpublished photo of a Mk.IC, Z1111/KX-N, wearing the camouflage colours appropriate to its user, the RAF Coastal Command. Note that the individual letter 'N' repeats as a small letter on the nose, just behind the front gun turret (above).

MPM P109533

A Mk.III, Z1572/VR-Q, of the 419th Squadron, one of eight RCAF units to operate this version, represents the first Hercules-powered variant of the Wellington. It wears the TLS camouflage finish with the straight boundary between upper and lower colours that was introduced in the summer of 1942. Note the application of anti-frost paste on the leading edge of the wing, tailplanes and fin, and the "discoloured" nose ring of the engine cowling.

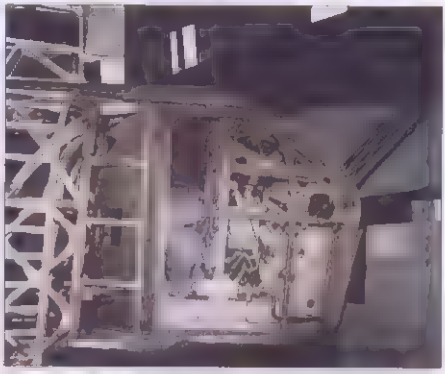
Mike Hooks



The 'MF628', a T Mk.10, is the only complete Wellington to survive, now at RAF Museum at Hendon. Built as a B Mk.X, it was converted to trainer standard in March 1948 and went on to serve with No.1 ANS at Hullavington, coded 'FFK-B'. After storage at St Athan it was displayed at RAF Abingdon in 1968 on the occasion of HM The Queen's Review of the RAF. In January 1981 the nose gun turret was fitted to replace the nose fairing which returned the aeroplane, externally at least, as B Mk.X standard.

No.304 'Masovia' (Polish) Squadron operated this "full-blooded" B Mk.X, HZ358/S, shown in this unique colour photograph from June 1943. The aeroplane sports the "transitional" Coastal Command camouflage scheme consisting of Dark Green and Dark Earth on upper surfaces, and White on wing undersurfaces, fuselage sides and vertical tail surfaces. A characteristic Polish checkerboard insignia is painted below the cockpit, just hidden behind the rotating propeller blades of the port engine. This aircraft later went to No.311 (Czechoslovak) Sq. which flew it, re-coded the 'A', from October to December 1943.

Jan Rašich collection

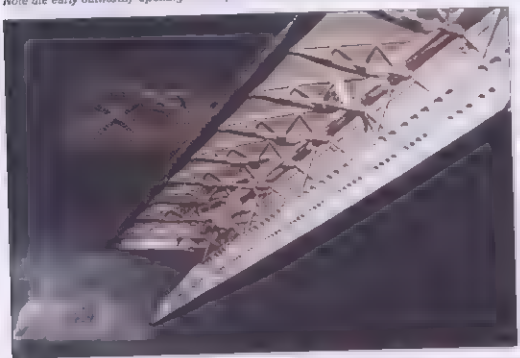


The fuselage nose of a Mk.IC, KX-N. The windscreen is of later production standard, with direct-vision corner panels. The cabin windows are faired over (unusually for this version) while the pilot's starboard sidewall window occupies the front portion – compare with the photo below in which the window is blanked out. The object just in front of the window is a thermometer fairing (right). An overall view of the Mk.IA rear gun turret, the FN5A, shows the irregular outline of the cupola, its shape and glazing.

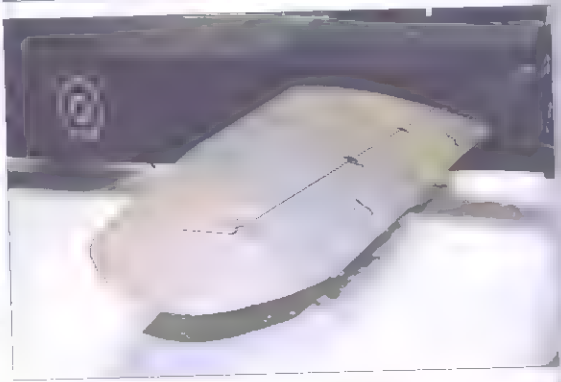
RAFM: P100691

A Canadian Wellington Mk.III is about to receive its 4,000lb HC "Cookie" bomb. In order to carry this highly-devastating charge, Type 423 modification had to be incorporated, thus enabling a single bomb to be slung in the bomb compartment. The aircraft is fitted with Rotol Electric wooden propellers and hubs without streamlined spinners. A number of colour details can be observed in the photo.

The starboard side of the fuselage immediately behind the wing trailing edge. The bottom longeron can be seen below the Type A roundel and the letter 'R'. A "wavy" demarcation line between Special Night and upper camouflage colours represents the style of paint applied during the later months of 1940 (left). A close-up view of the Mk.IA windscreen and cockpit hood. Note the early outwardly-opening corner panel hinged to the top frame (right)

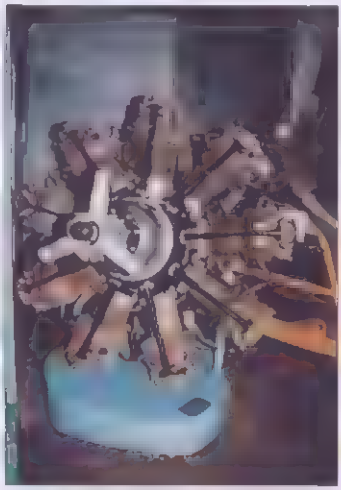


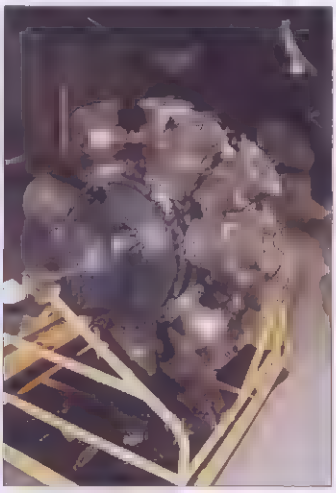
A lowered inner trailing edge flap exposes the internal rib construction. The tube in the centre is a flap-operating shaft controlled by a hydraulic jack near the root rib (above left). New doped fabric covering was only partially applied to 'R-for-Robert' (actually a Mk.IA, N2980/R, salvaged from Loch Ness in 1985 and now at Brooklands Museum) so the metal geodetic structure can be observed (above right). Streamlined engine nacelles were incorporated within the main planes. Sections of the three-piece trailing edge flap are also visible in this view (below right).

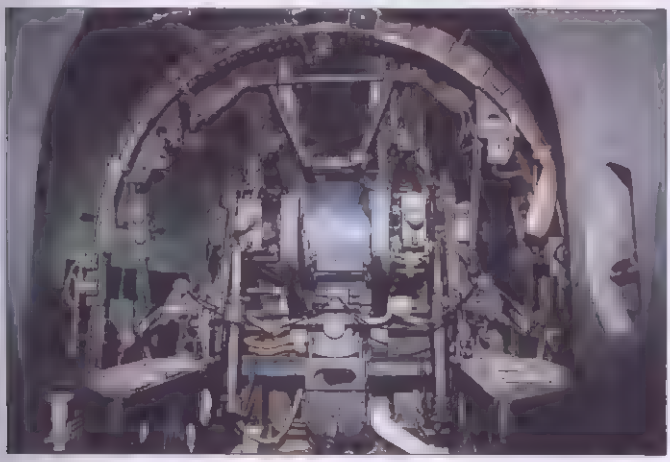


Vertical and horizontal tail surfaces with the horn-balanced rudder and elevator, representative of the late production batches of Mk.X aircraft. All components were fabric-covered except the leading edges and tips of the tailplane and the fin, which were metal-covered. Note the combined trimming/balance tab fitted to the rudder (above and right).

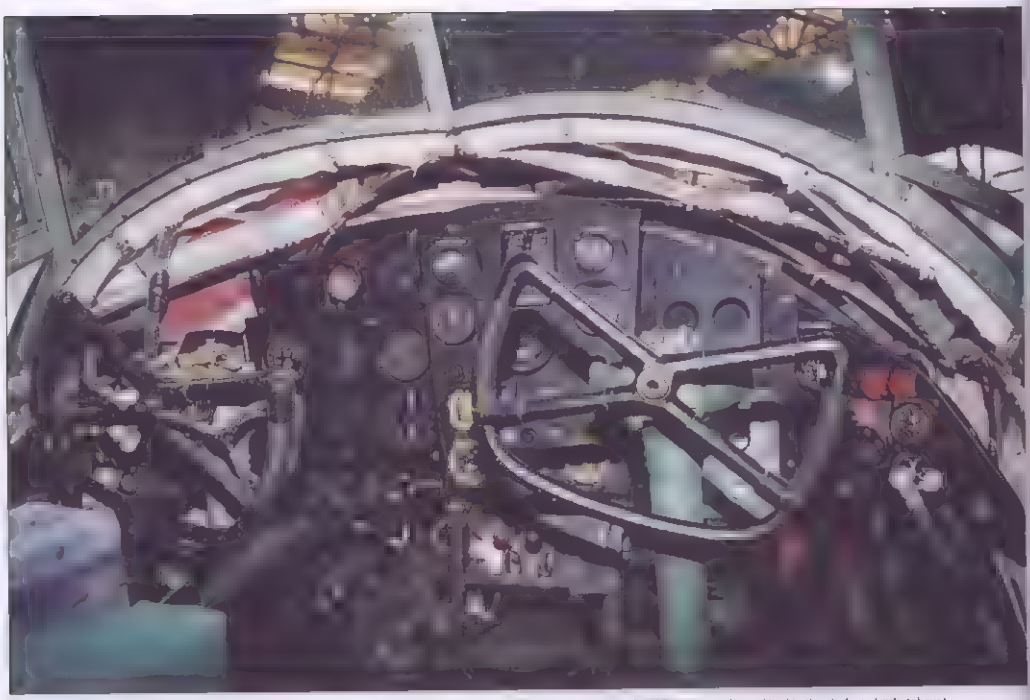
Mk.X bombers mounted 14-cylinder double-bank Bristol Hercules radials (above); a restored example of a Mk.XVI, mounted on a ground trolley, shows more details (below right). Mk.I, IA and IC aircraft were powered by 9 cylinder Pegasus XVIII engines, whose single row design can be observed, on the left, fitted to the nacelle mounting in front of the deflector ring, and, below centre, on a stand support. The latter exhibit came from the 'L7775'.



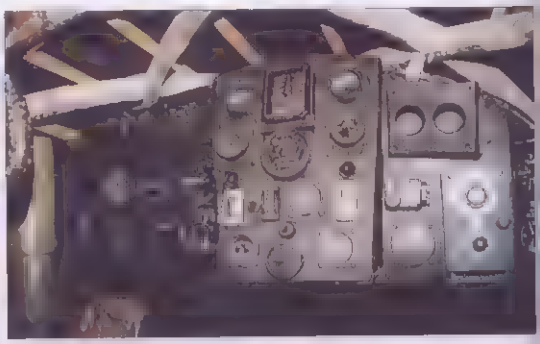


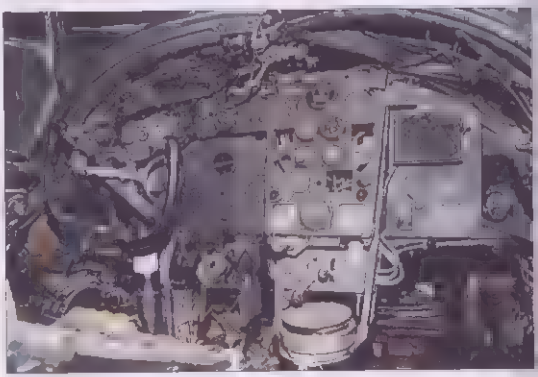


An overall view of the starboard main undercarriage, showing the twin leg assembly and the wheel well (top left). The same unit inner side, with the leg cross bracing; note the towing eye fitted only to the inboard shock absorber (right). This interior of a Fraser-Nash FN5A front gun turret reveals the gun mounting arrangement, machine gun controls and location of appropriate equipment (above).



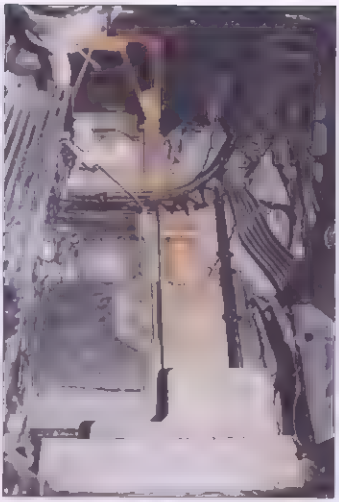
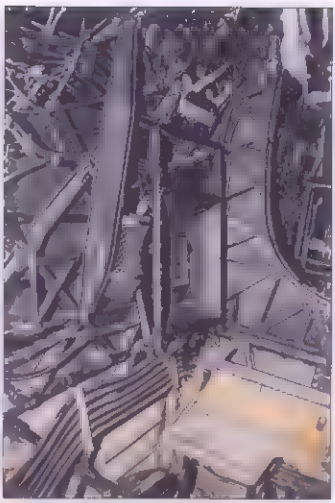
The pilot's "office" of the Wellington Mk.IA, painstakingly restored to its original appearance at Brooklands Museum. Dual flying controls are fitted to the starboard side (above). An unobstructed view of another preserved dashboard of an early Mark Wellington (below right).





An overall view of the T Mk.10 main instrument panel. It differed only in minor details from that of the mainstream B Mk.X variant (above).

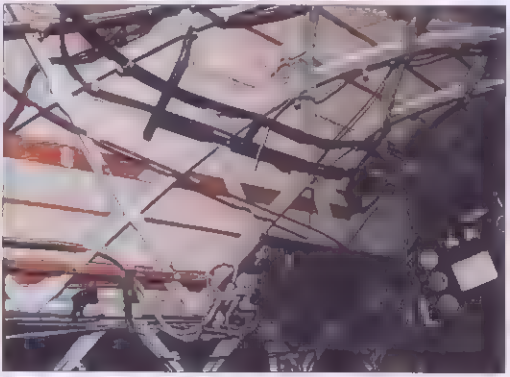
The pilot's seat with a leather back cushion, and the port side of the cockpit and its hood. Note the undercarriage warning horn above the seat (left).

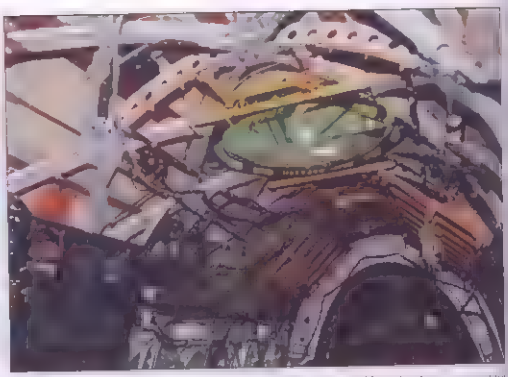
Photos in the upper row depict the bomb aimer's compartment in the front fuselage: on the left, the port side in front of the gun turret door shows the construction details and fabric covering; in the centre is an upholstered main entrance hatch which was also used, during flight, for sighting in the prone position through a transparent panel; and, on the right, is the second pilot's seat secured in the stowed position. Note the basket for 1-pint thermos flask just forward of the seat.



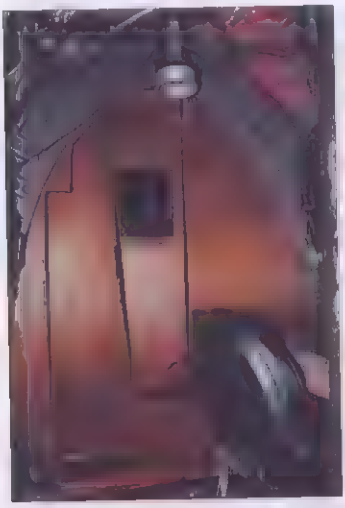
The wireless operator's station was located immediately behind the pilot's cockpit. The General Purpose wireless sets were mounted in a crate above the operator's table, with a transmitter above the receiver. In the photo on the left are the T.1083 and R.1082 of the Mk.IA, while in the centre T.1154 and R.1155 units of the Mk.X are shown. Right, the cabin walkway on the starboard side with the main electrical panel (in the background) and the tail unit de-icing system valve and control unit. The sheath on the door panel stowed a fireman's axe.

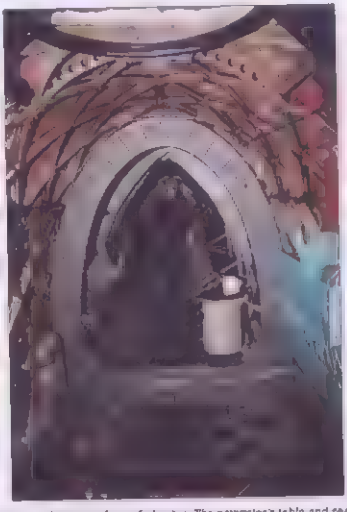



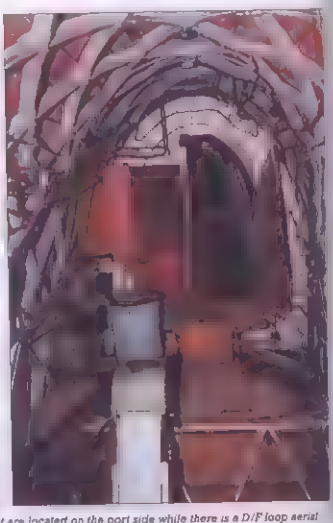
The wireless operator's seat, bolted to the floor, faced forward and accommodated a seat-type parachute (left). The port upper part of the wireless and navigator's sound-proofed cabin. A D/F loop aerial remote control hand-wheel is mounted above the oblong panel that carries the loop setting indicator and two oxygen regulators for the navigator and the radio operator. The green object is a hydraulic system header tank, while the protruding tube normally clamped the signal pistol (right).



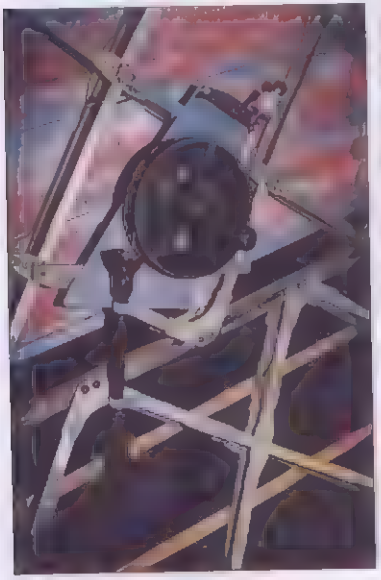
750-litre oxygen cylinders (each weighing 14.5 lb) were stowed in carriers on the sides of the roof aft of the leading edge frame. In the case of the Mk.IA, as shown, fifteen bottles were provided (above left). A T Mk.10 cabin roof with the transparent dome that was used as a look-out station and for taking sextant readings. It also served as an emergency exit in the event of crash-landing. Note the empty carriers for oxygen cylinders.







The leading edge frame and its panel enclosed the rear compartment of the sound-proofed cabin. The navigator's table and seat are located on the port side while there is a D/F loop aerial mounting at the top (left). The trailing edge frame and rear portion of the fuselage, looking aft (centre, Mk.IA aircraft) and forward (right, the T Mk.10). A plywood walkway led to the rear gun turret; additional panels and accessories were fitted in training aeroplanes. Note the launching tube and the chemical water-closet.

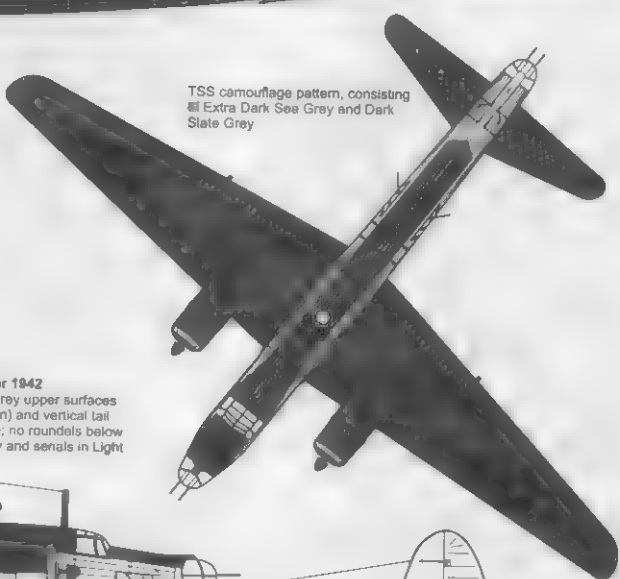


A Type O.2 azimuth compass was part of the navigational instrument set fitted to the navigator's station. A dimmer switch for the table lamp can be seen in the top right-hand corner (above). A standard winch, Type 5, operated the W/T trailing aerial, which was lowered through an insulated tube. The winch and aerial were located in the port side of the rear fuselage (left).

Wellington Mk.IC, T2835/AA-C
No.75 (New Zealand) Sq. RAF, Feltwell, Norfolk, early 1941
Dark Green, Dark Earth finish on upper surfaces to Type B scheme. Special Night (Black) lower surfaces, fuselage sides and vertical tail surfaces (incl. upper rear portion). Type B roundels on upper surfaces and Type A1 on fuselage. Lower wing roundels overpainted in Black. Medium Sea Grey codes and Dull Red serials.

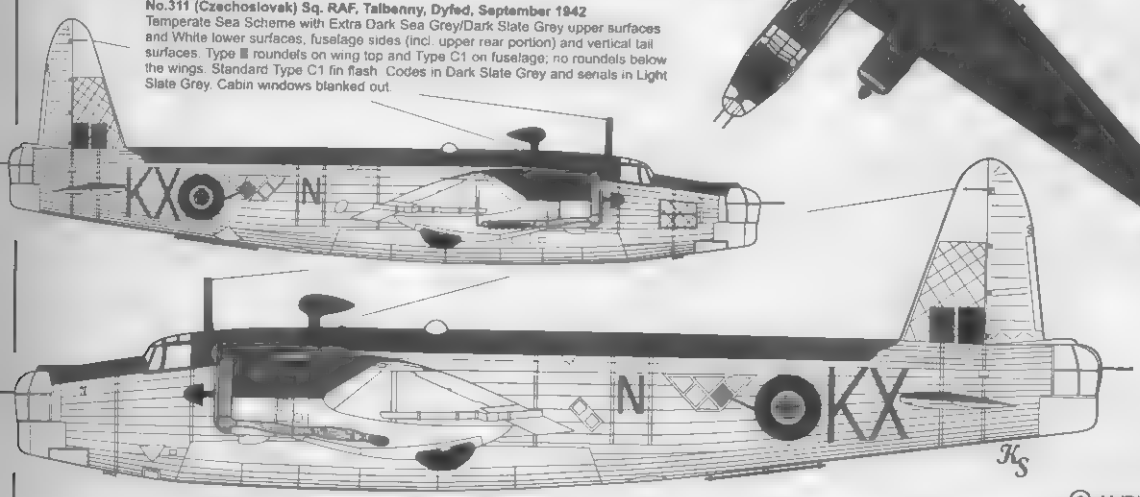
Wellington Mk.IC, X9889/BL-D
No.40 'Abingdon' Sq. RAF, Luqa, Malta, November 1941
Finish is Dark Green and Dark Earth to Type B camouflage scheme, with Special Night (Black) lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type B upperwing roundels and Type A1 roundels on fuselage. Medium Sea Grey codes and Dull Red serial numbers. Cabin windows painted over.

Dark Green
Dark Earth
Extra Dark Sea Grey
Dark Slate Grey
Light Slate Grey
Special Night (Black)
Medium Sea Grey
White
Bronze
Dull Blue
Dull Red
Yellow

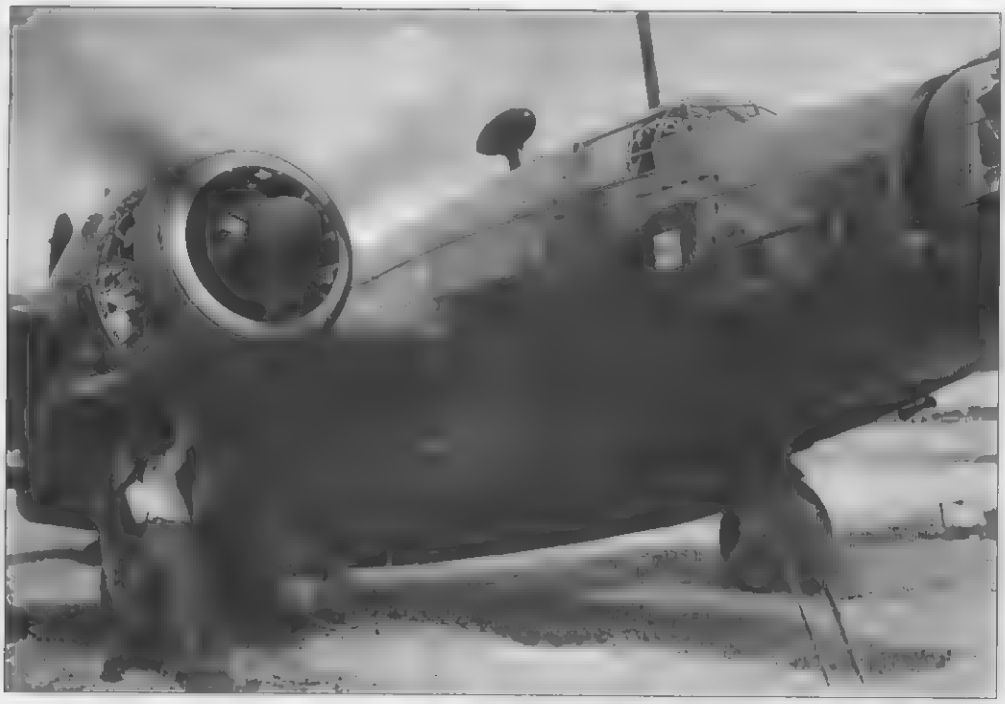


TSS camouflage pattern, consisting of Extra Dark Sea Grey and Dark Slate Grey

Wellington Mk.IC, Z1111/KX-N
No.311 (Czechoslovak) Sq. RAF, Talbenny, Dyfed, September 1942
Temperate Sea Scheme with Extra Dark Sea Grey/Dark Slate Grey upper surfaces and White lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type B roundels on wing top and Type C1 on fuselage; no roundels below the wings. Standard Type C1 fin flash. Codes in Dark Slate Grey and serials in Light Slate Grey. Cabin windows blanked out.



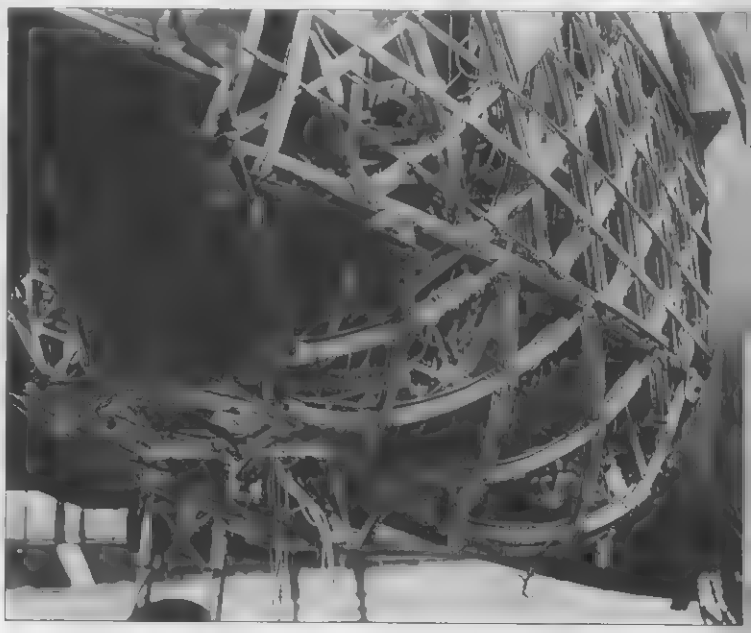
Mike Hooks



The front fuselage section of a Polish Wellington Mk.IC (304th Squadron aircraft) shows the position of the cabin window, the pilot's starboard sidewall window and the characteristic cut-out behind the front turret. Note also the engine exhaust pipe fitted with a "barbed" flame damper. An external 24V power supply cart was frequently used for ground starting engines.

The stripped-down nose section of a Mk.I reveals the light-alloy structure and side longitudinal stringers (below), while a similar view of a Mk.IC aircraft indicates the location of the bomb aimer's window and the main entrance hatch (below left).

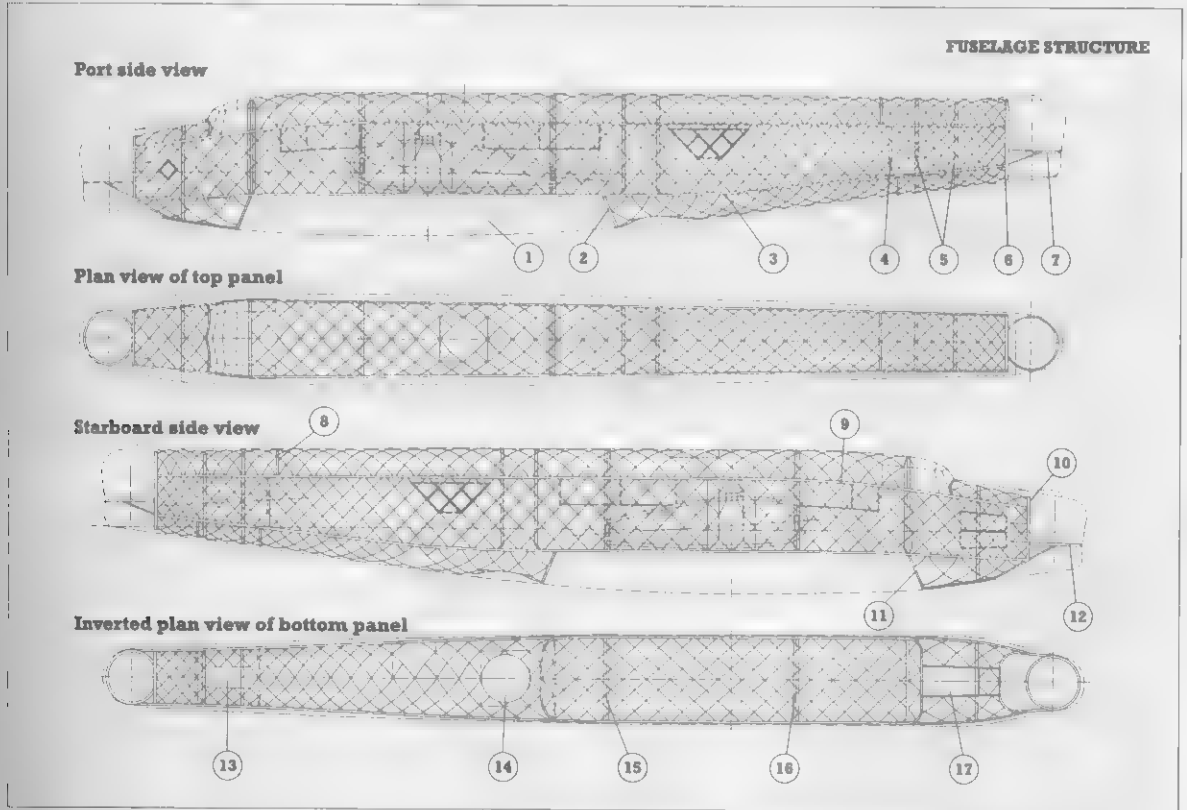
Jaroslaw Popelka



The fuselage nose with transparent bomb-sighting panels (below left) and front port side of a modified Mk.X aircraft (below right). The gunless turret is fixed and the gap between this and the fuselage is sealed with fabric.

Brooklands Museum Trust Ltd., D2805

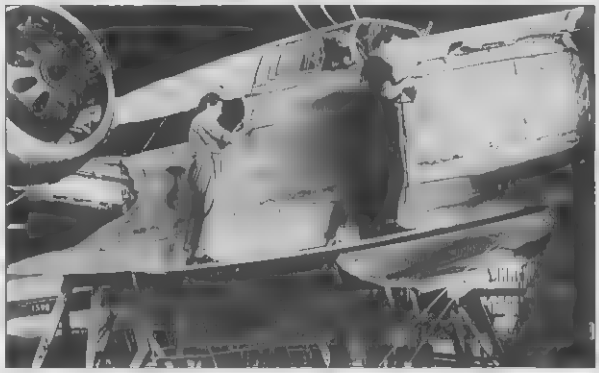
Mk.I airframes being completed with front Vickers-type gun turrets on the Weybridge production line. The fuselage consisted of top and bottom panel structures and two side panels. Openings for the pilot's cockpit and bomb aimer's window were provided in the front portion.



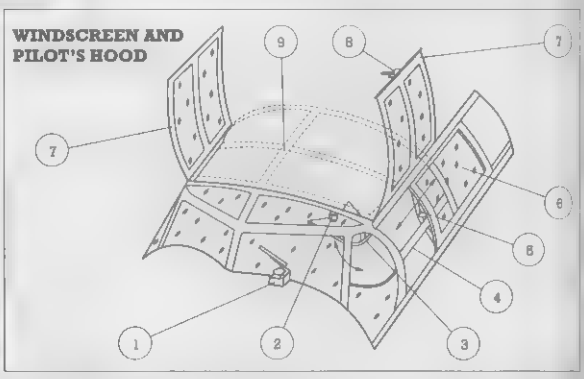
Fuselage structure of Mk.IC (late), Mk.II (late) and Mk.IV (other Marks similar):
1) Bomb compartment 2) Half frame 3) Bottom longeron 4) Side frame 5) Tail frames 6) Rear terminal ring 7) Rear turret mounting 8) Top frame 9) Top longeron 10) Front terminal ring 11) Hall frame 12) Front turret mounting 13) Tailwheel unit opening 14) Circular opening (for ventral turret, emergency exit or multiple flare chute) 15) Trailing edge frame 16) Leading edge frame 17) Main entrance hatch.

IWM, CM407A

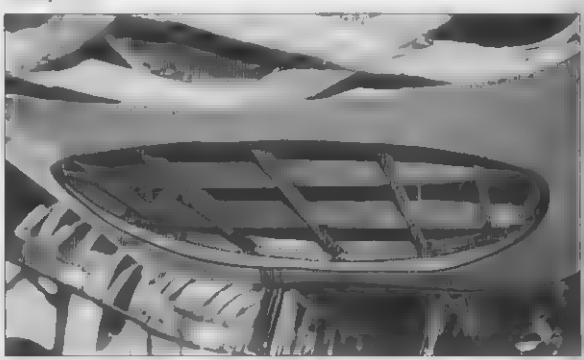
Front fuselage and pilot's cockpit canopy details. Although both photos depict Mk.IC aircraft, the windscreen wiper and direct-vision corner panel are only installed on the aircraft in the photo above.



Doped fabric covering being stretched over the stringers by skilled women workers. Double fabric was applied in the area of the airscrew discs. Note the metal bomb-bay doors (above).



***Pilot's cockpit canopy – late style:** 1) Windscreen wiper (one fitted ■ some Mks.IC, II and IV, twin wipers on Mk.III/Xs) ■ Spring clip 3) Inwardly-opening corner panel 4) Airscrew guard 5) Handle ■ Sliding window 7) Hood panels open ■ Latch mechanism and handle 9) Hood in closed position.*



Emergency exit hatches in the lower fuselage. The rhombic push-out panel was not fitted ■ Mk.I aircraft, while the circular opening accommodated an under-turret on some Mk.IA and ICs. On later Mark Wellingtons the turret was not installed and the opening was provided with formers and sealed by the fabric covering.

Jaroslav Popelka

The rear fuselage of an early Mk.IC, R1538/KX-R, which is not yet fitted with beam guns. A flare chute is visible between the letter 'R' and the wing trailing edge. Note also camouflage and marking details (above left). The rear portion of a fuselage under construction shows the terminal ring and turret mounting. The tube protruding from the side (above the head of the nearest worker) is a torsion shaft of the elevator spar tube (above right).

Wellington Mk.II, W5442/BU-V
No.214 'Federated Malay States' Sq. RAF, Stradishall, Suffolk, November 1941
Dark Green and Dark Earth upper surfaces to Type A scheme with Special Night (Black) undersurfaces, fuselage sides and vertical tail surfaces. Type B roundels above the wings, Type A1 on fuselage, no roundels below the wings. Medium Sea Grey codes and Dull Red serials.

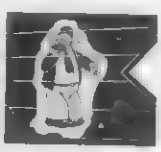
Squadron Tiger's head emblem in Black and White, Black inscription 'SRI GURCH' below cockpit on both sides, 26-bomb log ■ Yellow only on port side

Wellington Mk.II, Z8345/EP-S
No.104 Sq. RAF, Driffield, East Yorkshire, summer 1941
Standard Dark Green/Dark Earth finish on upper surfaces to Type B scheme. Lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces ■ Special Night (Black). Type B roundels on upper surfaces. Type A1 on fuselage, no roundels under the wings. Medium Sea Grey codes and Dull Red serials

The same aircraft, with 'EP' painted over, serving with No.158 Sq. RAF, Kabrit, Egypt in February 1942

Dark Green
Dark Earth
Special Night (Black)
Medium Sea Grey
White
Bronze
Dull Blue
Dull Red
Yellow

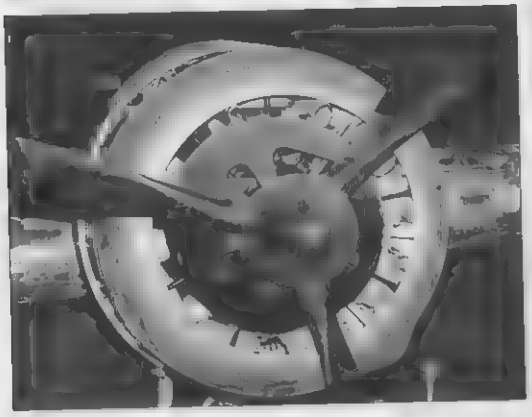
Wellington Mk.II, W5381/PH-W
No.12 Sq. RAF, Binbrook, Lincolnshire, 1942
Dark Green and Dark Earth camouflage to B-scheme with Special Night (Black) lower surfaces, fuselage sides and vertical tail surfaces. Type B roundels above the wings and Type A1 on fuselage. Codes ■ Medium Sea Grey, serial numbers Dull Red.



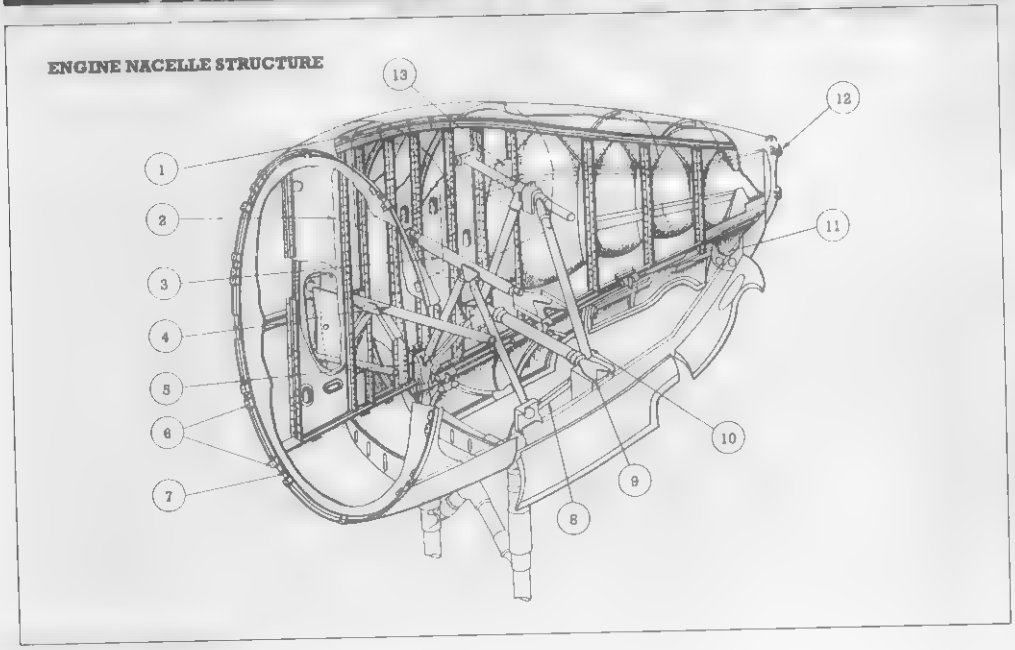
Cartoon motif ■ J. Wellington Wimpy carried on the nose port side

IWM. CH507

Servicing an early Mark Wellington fitted with a Bristol Pegasus XVIII engine. With the cowling panels detached, the tubular members of the engine mounting, oil cooler ducts, cylinder baffles and enclosed valve gears can be seen. Note the fireproof bulkhead and gill support ring with arms.



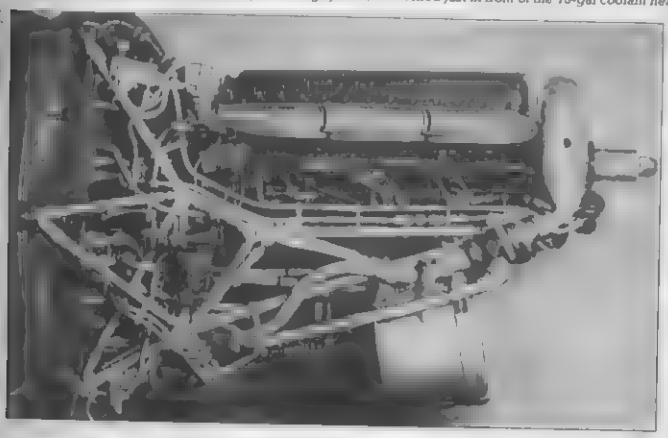
A Mk.IA part engine nose ring and perforated baffle plate, which was a significant feature of the Pegasus-powered aircraft. Eight apertures were provided in the baffle plate through which air was directed onto the cylinder heads (note the different shape of the one aperture). Oil cooler air intakes are mounted in the upper part of the slot (below left).



The nose of the engine cowling was formed by an exhaust collector ring with a sideways-mounted exhaust pipe. The airscrew is a Hamilton/de Havilland unit fitted with metal blades. Note that the engine baffle plate was removed on some machines (above).

Port engine nacelle:
1) Upper front nacelle fairing 2) Oil tank 3) Front transverse frame 4) Wing leading edge spar 5) Undercarriage strut mounting 6) Engine cowling attachments 7) Engine mounting attachment 8) Tie-bar 9) Undercarriage backstay mounting 10) Rear transverse frame 11) Undercarriage door hinge 12) Wing trailing edge spar attachment 13) Fuel tank.

The only in-line engine installation in the Wellington was the Rolls-Royce Merlin X, equipped with a two-speed supercharger. The port engine is shown above and below left, with a tubular structure mounted onto the nacelle bulkhead at six points. A prominent oil cooler is suspended below the engine, while the VSG hydraulic pump is fitted behind it. A Pesco pump, supplying the flying instruments and the leading edge de-icing system, is installed just in front of the 15-gal coolant header tank.



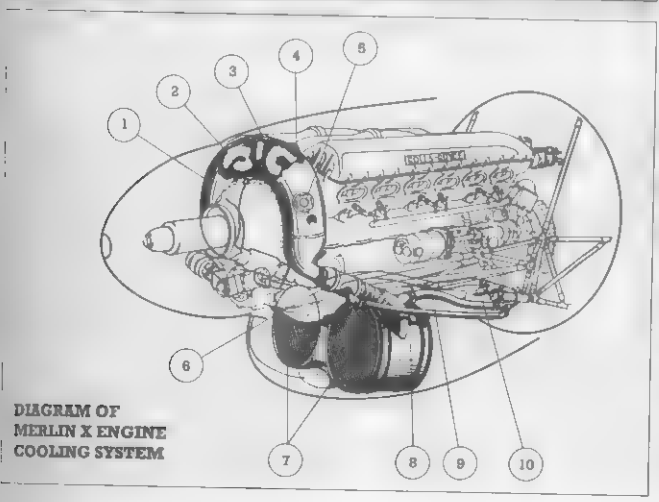
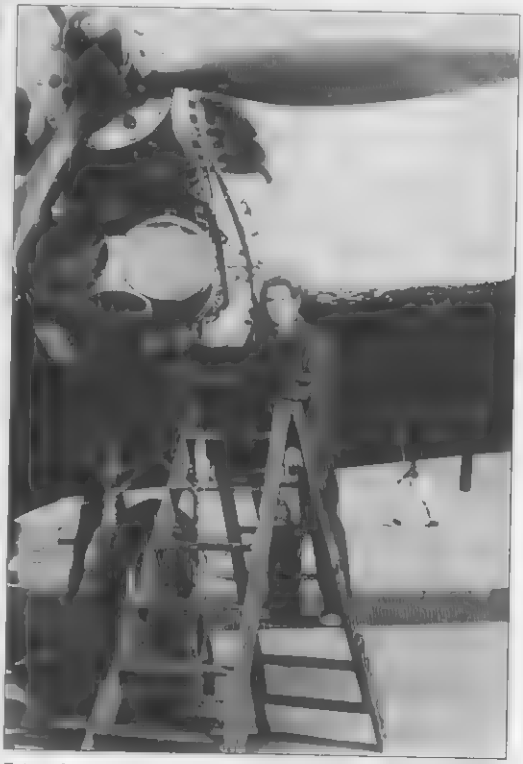


DIAGRAM OF MERLIN X ENGINE COOLING SYSTEM



Twin coolant radiators, with an oil cooler between, mounted beneath the Merlin engine. The propeller is the de Havilland Hydromatic – the blades are made of forged duralumin (above).

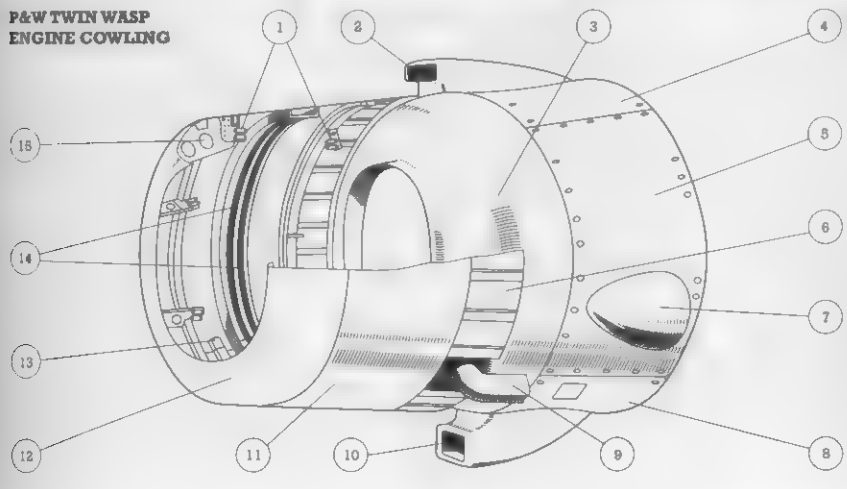
Coolant system: *1) Header tank 2) Swirl pipes 3) Steam dome 4) Engine outlet 5) Coolant filler cap 6) Thermostat 7) Honeycomb radiators 8) By-pass pipe 9) Return pipe 10) Coolant pump connection.*

The shortage of British engines forced the Air Ministry to implement an American-built Pratt & Whitney Twin Wasp for the Wellington, thus evolving as the Mk.IV variant. External distinguishing marks were smaller diameter cowlings, housing an S3C4-G version of the R-1830 14-cylinder radial, and an exhaust pipe protruding from the gill ring. A constant-speed Curtiss Electric metal airscrew is fitted here, replacing the earlier noisy installation of the Hamilton/de Havilland propeller. The heating system header tank is mounted in the engine accessories bay (right).

Brooklands Museum Trust Ltd., 10,7535

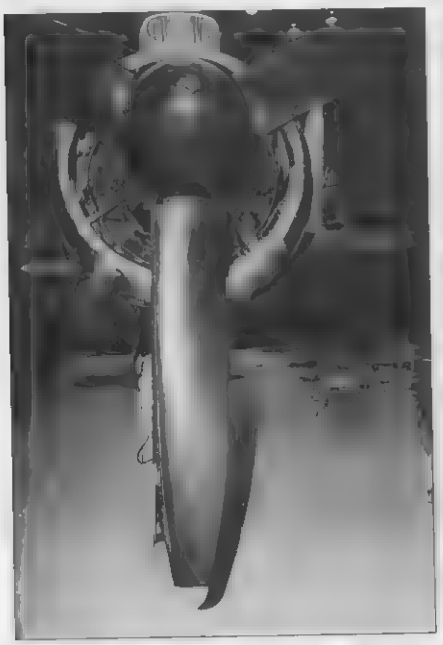
With its forward semi-cylindrical and rear side panels removed, the starboard engine's W-shaped tubular structure of the engine mounting is disclosed (below).

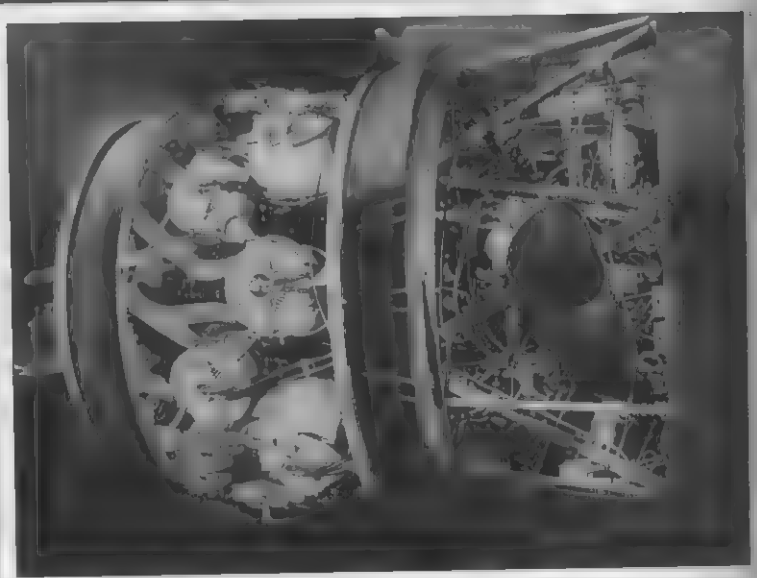
The outlet pipe of the fuel jettisoning system extending along the wing under-surface. The system was a salient feature of aeroplanes beginning from the Mk.IA. Note that the pipe bent when the flaps were lowered (above).



Twin Wasp engine cowling diagram: 1) Links to cylinder lugs 2) Carburettor intake 3) Deflector ring 4) Top panel 5) Side panel 6) Gill ring 7) Louvre for oil cooler air outlet 8) Bottom panel 9) Exhaust 10) Oil cooler intake 11) Two-piece wrapper cowl 12) Front ring 13) Tension device 14) Sealing strips 15) Attachment bracket.

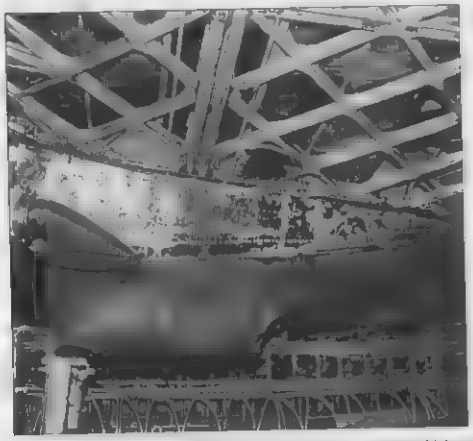
A real "draught-horse" for the Wellington was the Hercules 14-cylinder sleeve-valve engine, first fitted to Mk.III aircraft. Photos on the left and below right show the Hercules Mk.XI, its mounting, cowling, auxiliary drive and gearbox, which was produced as a "pack unit" by Bristols to facilitate installation and replacement. A short carburettor air scoop was mounted above the cowling, while an oil cooler air intake was placed beneath the engine. A secondary duct, seen in the starboard view in front of the fireproof bulkhead, led cooling air to the electric generator and the compressors, and was only fitted to the starboard engine. Note the later form of the exhaust collector ring, with a sharp lip on the nose ring that aided uniform cooling.

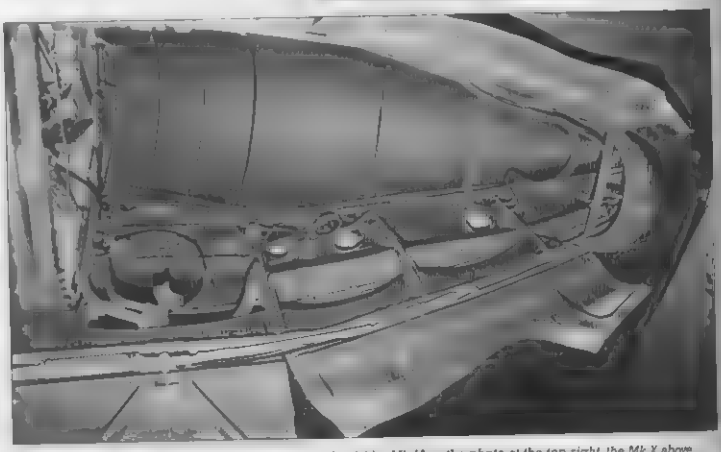




Rotol propellers, with wooden blades and brass leading edge sheathing, were characteristic features of the majority of the Hercules-powered aircraft (left). NACA engine cowlings of the Mk.X aircraft fitted with "barbed" flame damping exhaust pipes on their inboard sides. The tubes incorporated in the exhaust pipe and the vent duct were part of the cabin heating system.

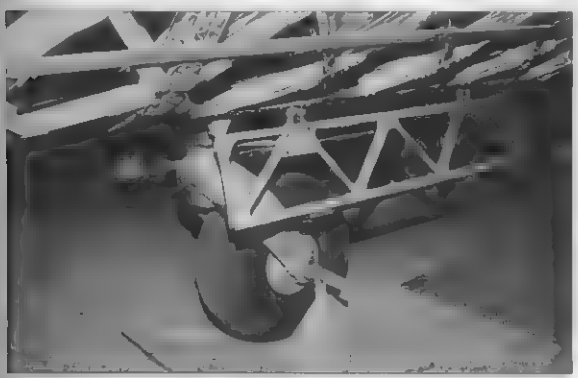
Each undercarriage was provided with two pairs of doors that closed automatically when the landing gear retracted. From the Mk.IA onwards larger diameter wheels were employed necessitating cut-outs in the doors. When the undercarriage was fully retracted part of the tyre protruded through this gap and the remaining clearance was sealed by rubber strips. Note the difference in cut-out shape between the Mk.X (above) and the Mk.IA (below left), and another type of tyre tread design compared to that [illegible] the wheel shown on [illegible].

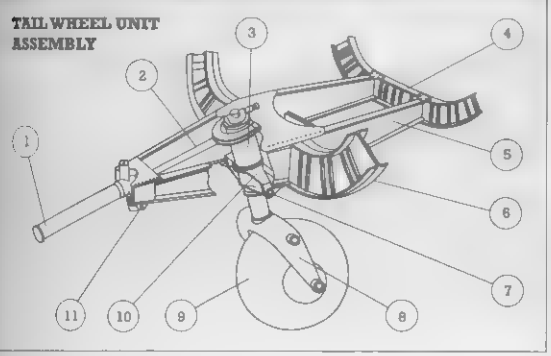


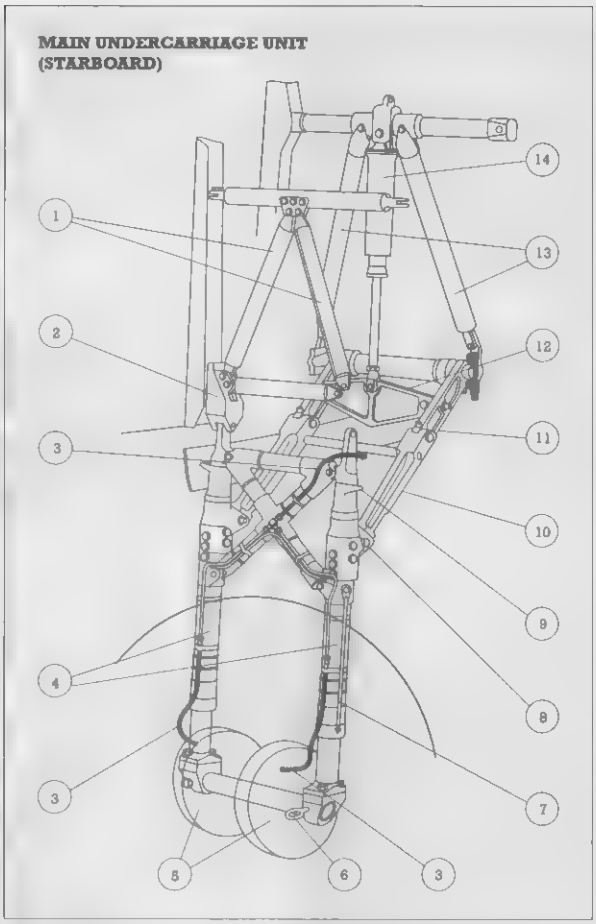


The interior of the rear portion of the starboard engine nacelle, which creates a well for the retracted undercarriage leg and wheel (the Mk.IA in the photo at the top right, the Mk.X above right). The door hinges, which can be seen in the photo above right, incorporated the operating arms, spirally-grooved hinge pins and push rods. When retracting the undercarriage, mechanical transfer moved the pin and the hinge arms engaged in the grooves, thus closing the doors.

Nacelle interiors of the Mk.X (left and centre) and the Mk.IA, looking forward. The wing main spar crosses the nacelle in the centre, tapering towards the wing tip. The triangular object below it is a backstay yoke operated by a single hydraulic jack, just visible behind the spar girders. A dinghy container, with a recess for the wheel, is installed in Mk.IA aircraft nacelle, while it was removed from the Mk.X example.

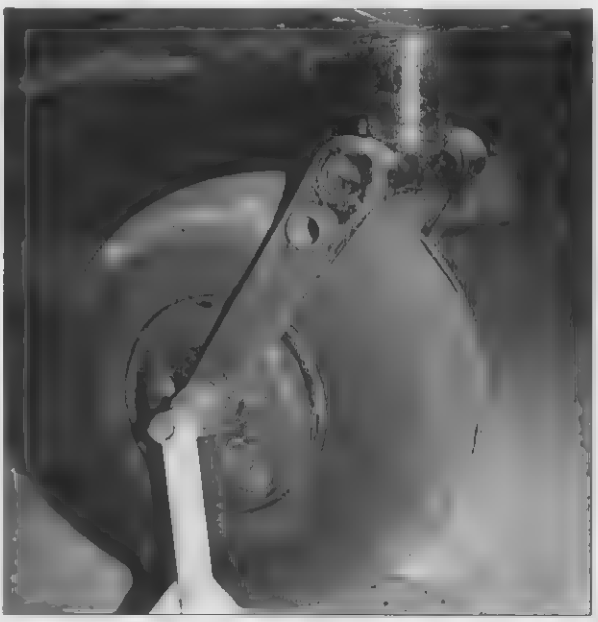






Main undercarriage: *1) Front transverse frame 2) Undercarriage hinge 3) Brake piping 4) Oleo cylinder 5) Brake drums 6) Towing eye 7) Safety rod 8) Backstay hinge 9) Door stop 10) Lower backstay 11) Upper backstay 12) Backstay yoke 13) Rear transverse frame 14) Operating jack.*

These photos of the outer sides of Mk.IC and Mk.X main wheels (top left and left, respectively) clearly indicate the wheel disk innovation of the latter.



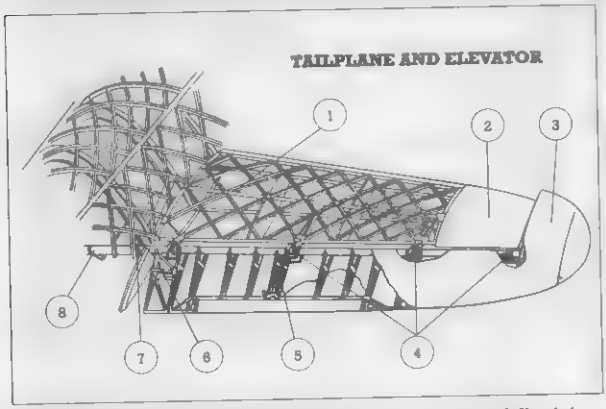
Two types of tailwheel forks were used during production; the "angular" type was introduced after the modification of the tailwheel and the deletion of the hinged doors, beginning from late Mk.IA aircraft (above left and above).

Tailwheel unit: *1) Operating jack 2) Jack piston rod 3) Vickers shock-absorber strut 4) Tail frame 5) Mounting structure 6) Main tail frame at station No.85 7) Strut hinge 8) Wheel fork 9) Dunlop wheel and tyre 10) Trunnion 11) Jack hinge.*

Trailing edge flap interior, with the ribs, stringers and undersurface made of light alloy. The operating push-rods lay at an angle to the flap shaft, so that the inboard or outboard movement of the latter caused the flap to be lowered or raised (above). The outer portion of the semi-Frise type starboard aileron. The formation-keeping light cover has been painted over (right).

BBMF Collection

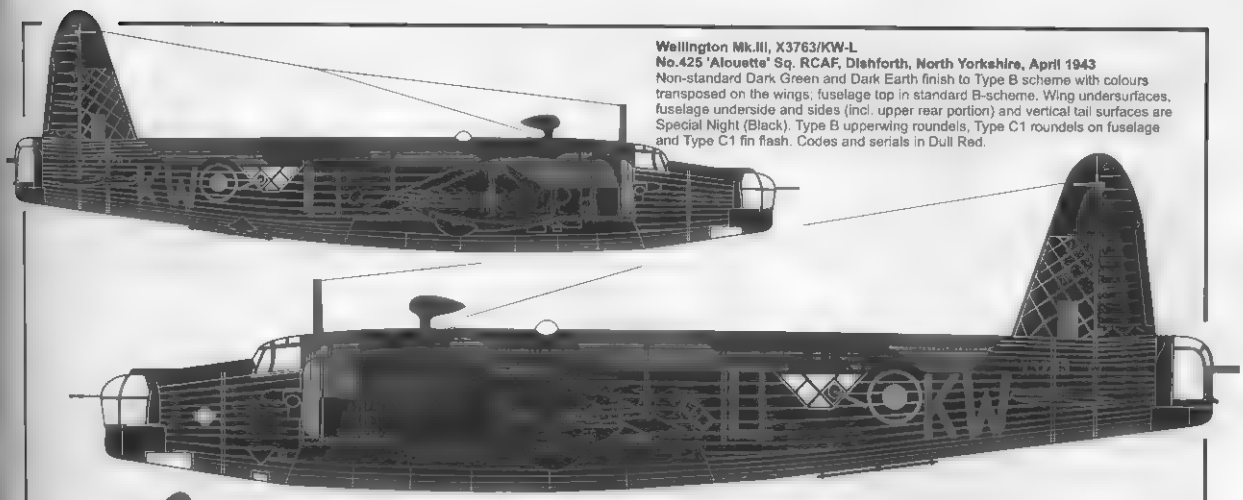
Completely stripped of its fabric covering, every detail of the fin and rudder construction can be seen. The fin was bolted to the fuselage frames at three stations, while the rudder was hinged to the fin at four points (left). De-icing paste was frequently applied to the leading edges, thus rendering a rather worn-out appearance, as on this Mk.IV aircraft (centre). A horn and mass-balanced rudder was fitted to later Mk.Xs (right). Note the rudder tip and trim chord differences between the two aeroplanes.

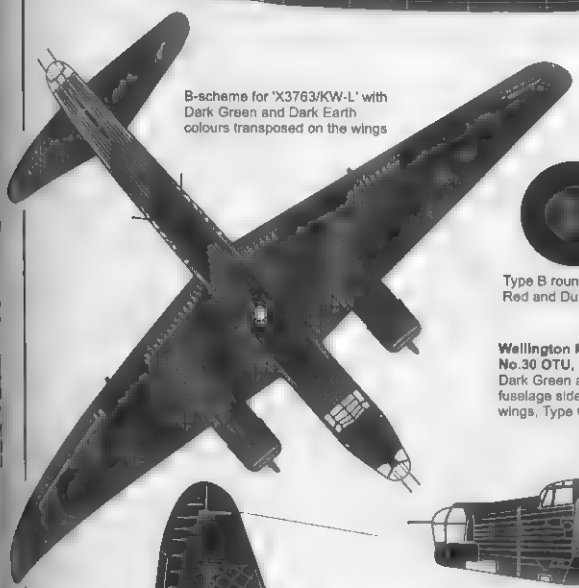


Tailplane and elevator structure: *1) Top geodetic panel 2) Sheet-metal skin 3) Horn balance 4) Elevator hinge 5) Trimming tab 6) Bonding leads 7) Torque tube/spar connection 8) Elevator control lever.*

Four hinges secured the elevator to the tailplane trailing edge spar. The tab mass-balance weights and actuating rod are discernible in the photo above.

Wellington Mk.III, X3763/KW-L
No.425 'Alouette' Sq. RCAF, Dishforth, North Yorkshire, April 1943
Non-standard Dark Green and Dark Earth finish to Type B scheme with colours transposed on the wings; fuselage top in standard B-scheme. Wing undersurfaces, fuselage underside and sides (incl. upper rear portion) and vertical tail surfaces are Special Night (Black). Type B upperwing roundels, Type C1 roundels on fuselage and Type C1 fin flash. Codes and serials in Dull Red.



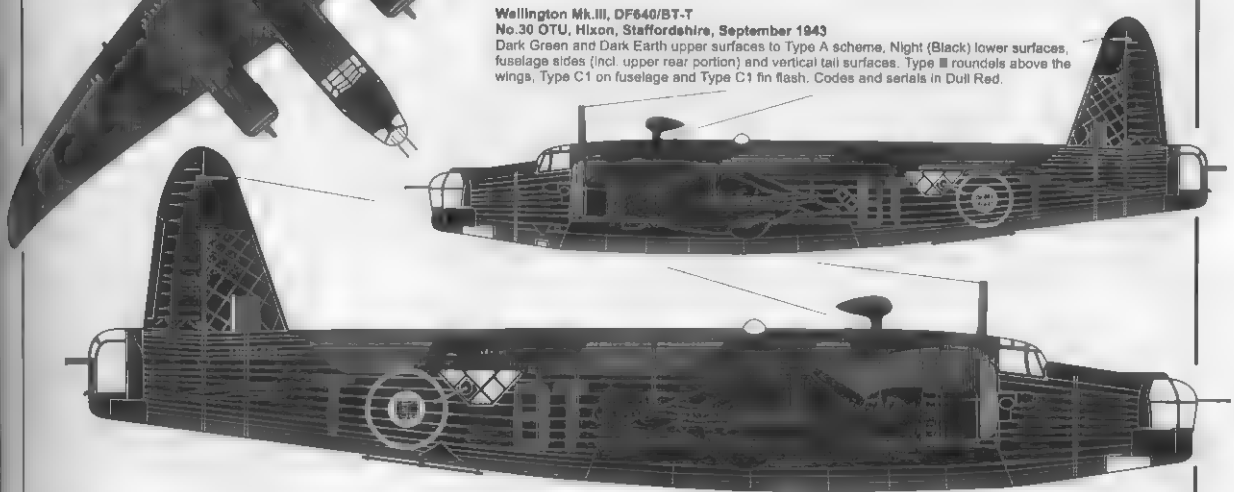


B-scheme for 'X3763/KW-L' with Dark Green and Dark Earth colours transposed on the wings

Dark Green	White
Dark Earth	Bronze
Night (Black)/Special Night (Black)	Dull Blue
Medium Sea Grey	Dull Red
	Yellow

Type B roundel ■ Dull Red and Dull Blue

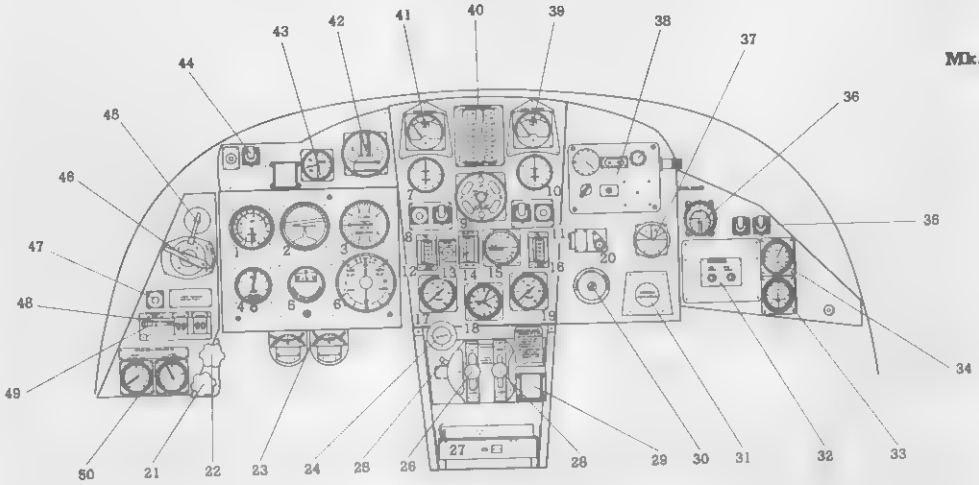
Wellington Mk.III, DF640/BT-T
No.30 OTU, Hixon, Staffordshire, September 1943
Dark Green and Dark Earth upper surfaces to Type A scheme, Night (Black) lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type ■ roundels above the wings, Type C1 on fuselage and Type C1 fin flash. Codes and serials in Dull Red.



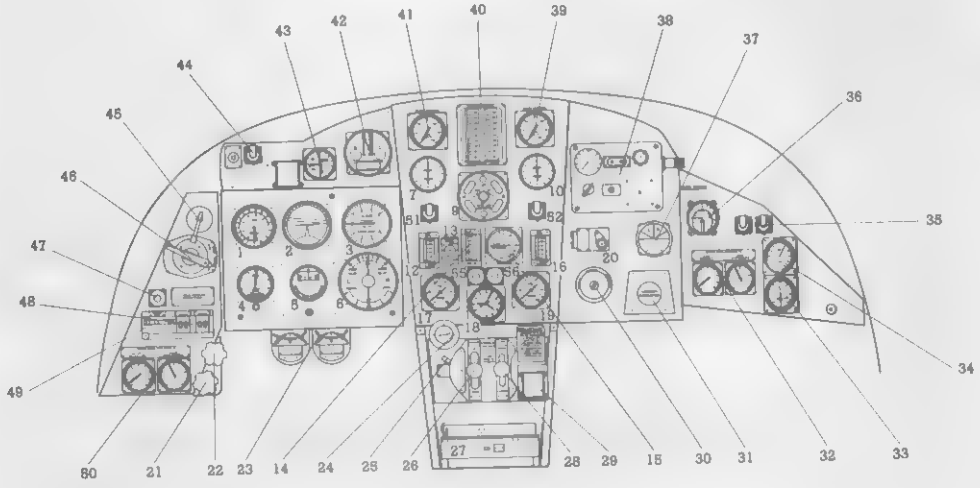
Polish checkerboard insignia, of the same pattern on both sides, ■ Red and White

Wellington Mk.IV, Z1382/BH-V
No.300 'Masovian' (Polish) Sq. RAF, Martlesham Heath, Suffolk, late 1942
Dark Green and Dark Earth finish to Type A scheme with Special Night (Black) lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type ■ roundels on upper surfaces, Type C1 fin flash and fuselage roundel. Codes and serials in Dull Red. Polish insignia below the cockpit on both sides.

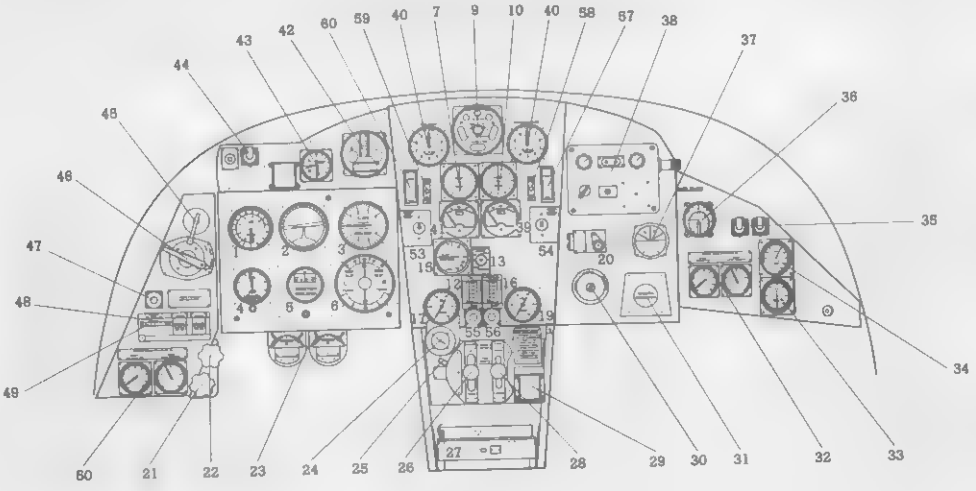
Mk.I, IA, IC



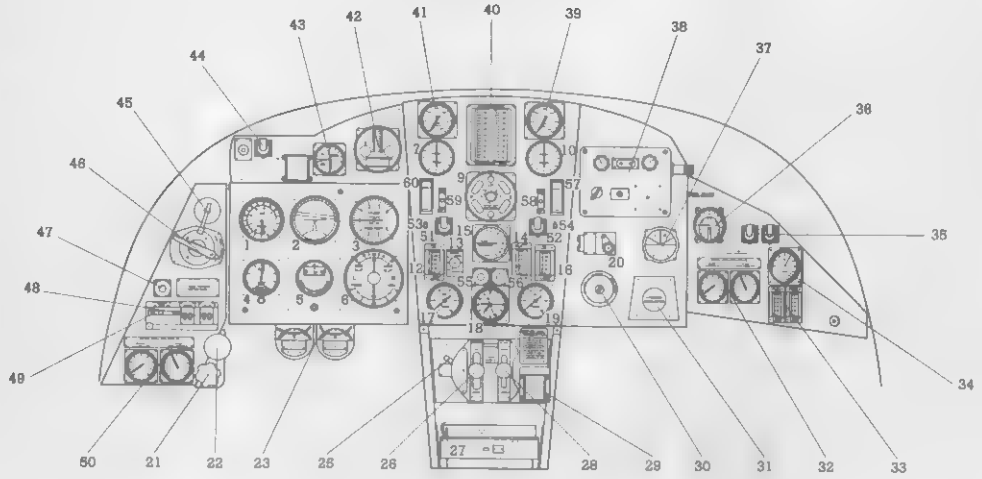
Mk.II



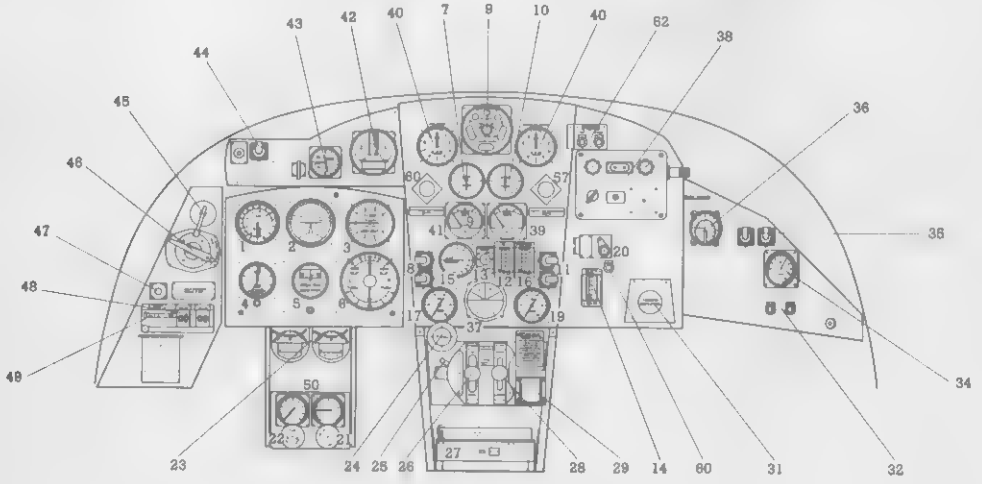
Mk.III



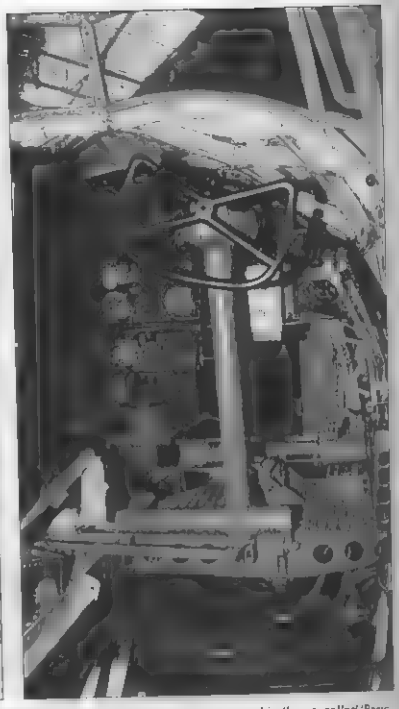
Mk.IV



Mk.X

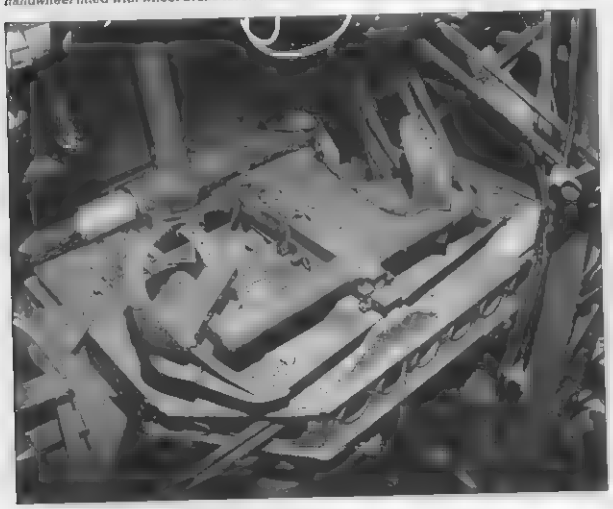


Instrument panel: *1) Airspeed indicator 2) Artificial horizon 3) Rate-of-climb indicator 4) Altimeter 5) Direction indicator 6) Turning indicator 7) Boost pressure gauge (port engine) 8) Starter and booster coil pushbuttons (port engine) 9) Undercarriage indicator 10) Boost pressure gauge (starboard engine) 11) Starter and booster coil pushbuttons (starboard engine) 12) Oil pressure gauge (port engine) 13) Boost gauge reversal control 14) Suction gauge 15) Flap indicator 16) Oil pressure gauge (starboard engine) 17) Oil temperature gauge (port engine) 18) Clock 19) Oil temperature gauge (starboard engine) 20) "Call" lamp and switch (visual signalling system) 21) Compressed air supply control for fuel jettisoning system 22) Fuel jettisoning and vent valves control 23) Signalling switchboxes for upward and downward identification lights and for formation-keeping lights 24) Windscreen de-icing handpump 25) Safety catch release for alighting gear control lever 26) Alighting gear hydraulic control lever 27) P-Type compass 28) Trailing edge flaps hydraulic control lever 29) Compass deviation card holder 30) Airscrew de-icing system control rheostat 31) Camera indicator wedge plate 32) Fuel pressure warning lights 33) Fuel pressure gauge 34) Air temperature gauge 35) Fire extinguisher pushbuttons 36) Wheel brake system triple air pressure gauge 37) D/F loop scale setting indicator 38) Beam approach system control box 39) Cylinder temperature gauge (starboard engine) 40) Engine speed indicators (port and starboard engine) 41) Cylinder temperature gauge (port engine) 42) Beam approach visual control 43) Auto-controls "nose-heavy", "tail heavy" and main pressure gauge 44) Bomb jettison remote control 45) Bomb master switch 46) Bomb doors control 47) Bomb-firing key 48) Magneto switches 49) Undercarriage indicator switch 50) Oxygen regulator unit 51) Starter pushbutton (port engine) 52) Starter pushbutton (starboard engine) 53) Port airscrew selector switch 54) Starboard airscrew selector switch 55) Undercarriage warning horn push-switch 56) Fuel gauges push-switch 57) Starboard airscrew feathering switch 58) Starboard airscrew control master switch and overload release 59) Port airscrew control master switch and overload release 60) Port airscrew feathering switch 61) Flare-launching warning lamp 62) Oil tanks low-level warning lamps.*

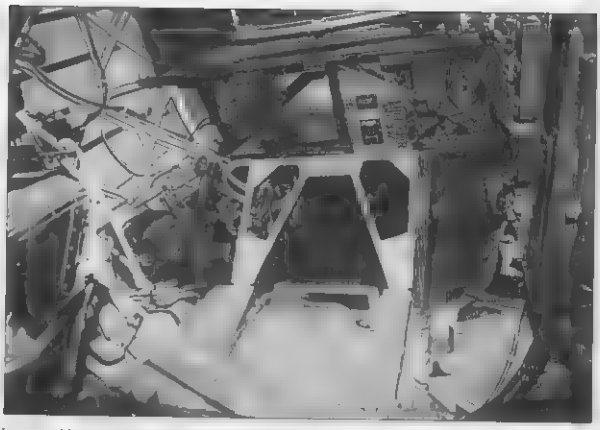


Engine control and u/c position indicators were mounted ■ the centre of the pilot's instrument panel (left), whereas the flight instruments were on the port side grouped in the so-called 'Basic Six' panel (centre). Adjacent to the panel, on the console, were bomb door and bomb release controls. The four knobs beneath the windscreen coaming operated the cockpit lighting. For instrumentation and control details refer ■ pp. 46 and 47. The photo on the right shows dual flying controls, mounted on a special floor extension, and the control column coupling connection.

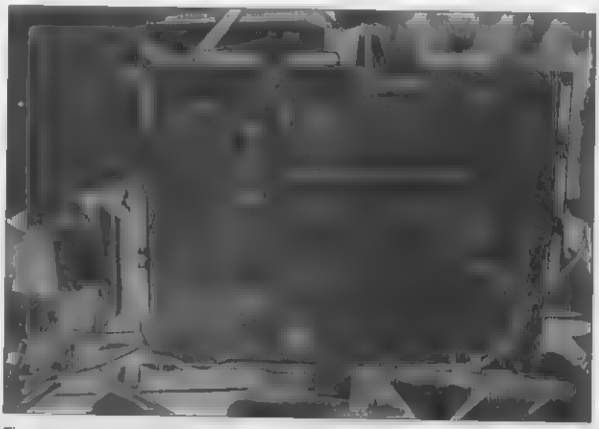
The pilot was seated on the port side of the cockpit, while the starboard side was left clear to enable through passage. A P-type (for Pilot) Magnetic Compass was suspended below the central panel. The three rod levers belong to the windscreen de-icing handpump, undercarriage and trailing edge flaps controls (above left). A later design of the pilot's spectacle-type control handwheel fitted with wheel brake levers, an intercom microphone and TRA pushbuttons (right).



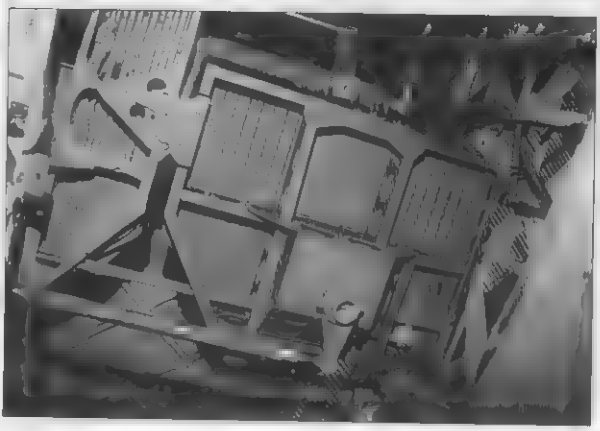
The cockpit floor platform with the pilot's rudder pedals, looking rearwards (left) and the floor extension and pedals of the dual flying control■ installation (above). In the centre there is a leg reach adjusting star wheel.



The inner door at the fuselage front terminal ring, giving access to the gun turret. Its cupola ring frame and base are visible through the supporting structure (left). The bomb aimer's station of the T Mk.10 (right). The main control panel is located on the right-hand side and is depicted in the photo below right. Normally the T.1 bombsight was fitted to the port side of the compartment. The small panel in the centre holds switches for the camera selector and for flare chute operation.



The front half frame at station No. [illegible], dividing the bomb bay from the bomb aimer's compartment. The steps on the left lead to the fuselage cabin, while at the top are the auto-controls components (above left). A Type 'A' control panel for the bomb aimer mounted on the starboard side of his station, here an example fitted to Mk.II aircraft. The prominent double-row panel holds the bomb loading sockets, with a bomb selector switch unit above it and an automatic bomb distributor below (above right).

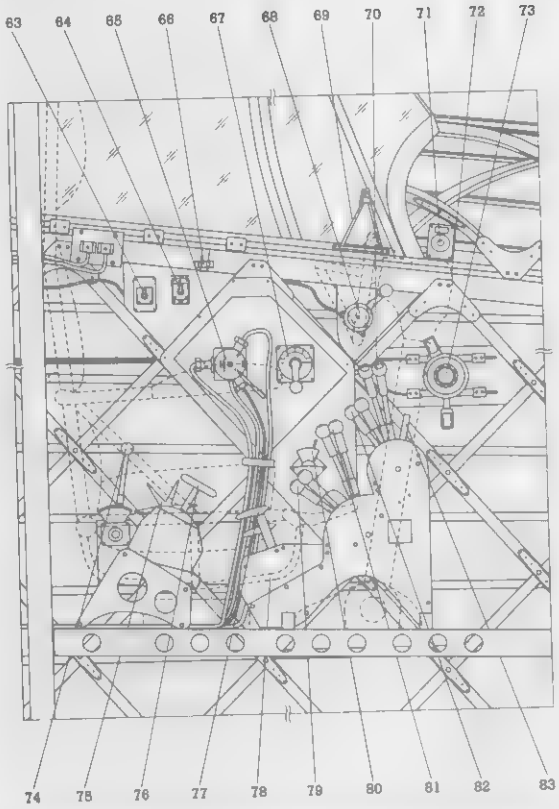


A plethora of tubes and wiring hidden behind the instrument panel (above). Another two unusual views show the bottom of the pilot's cockpit floor (top right) and an extension platform with the connecting rods of the dual flying controls (right).

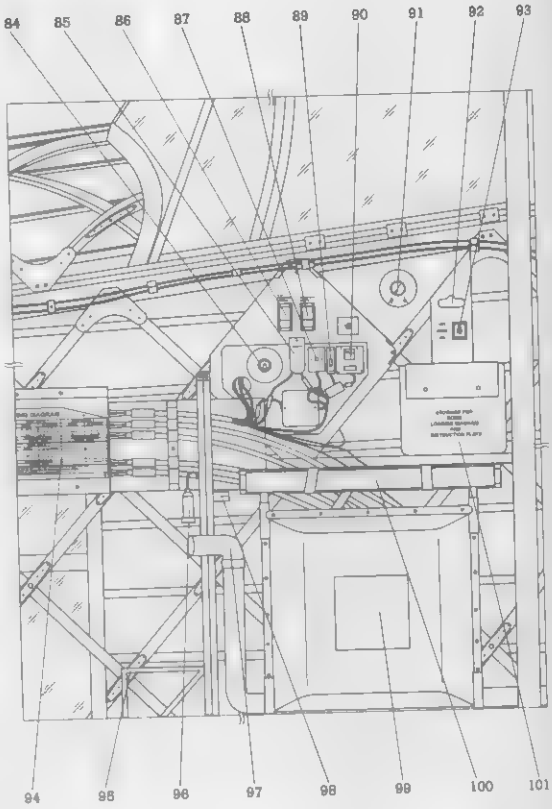
Wellington cockpit

All variants

Port side



Starboard side



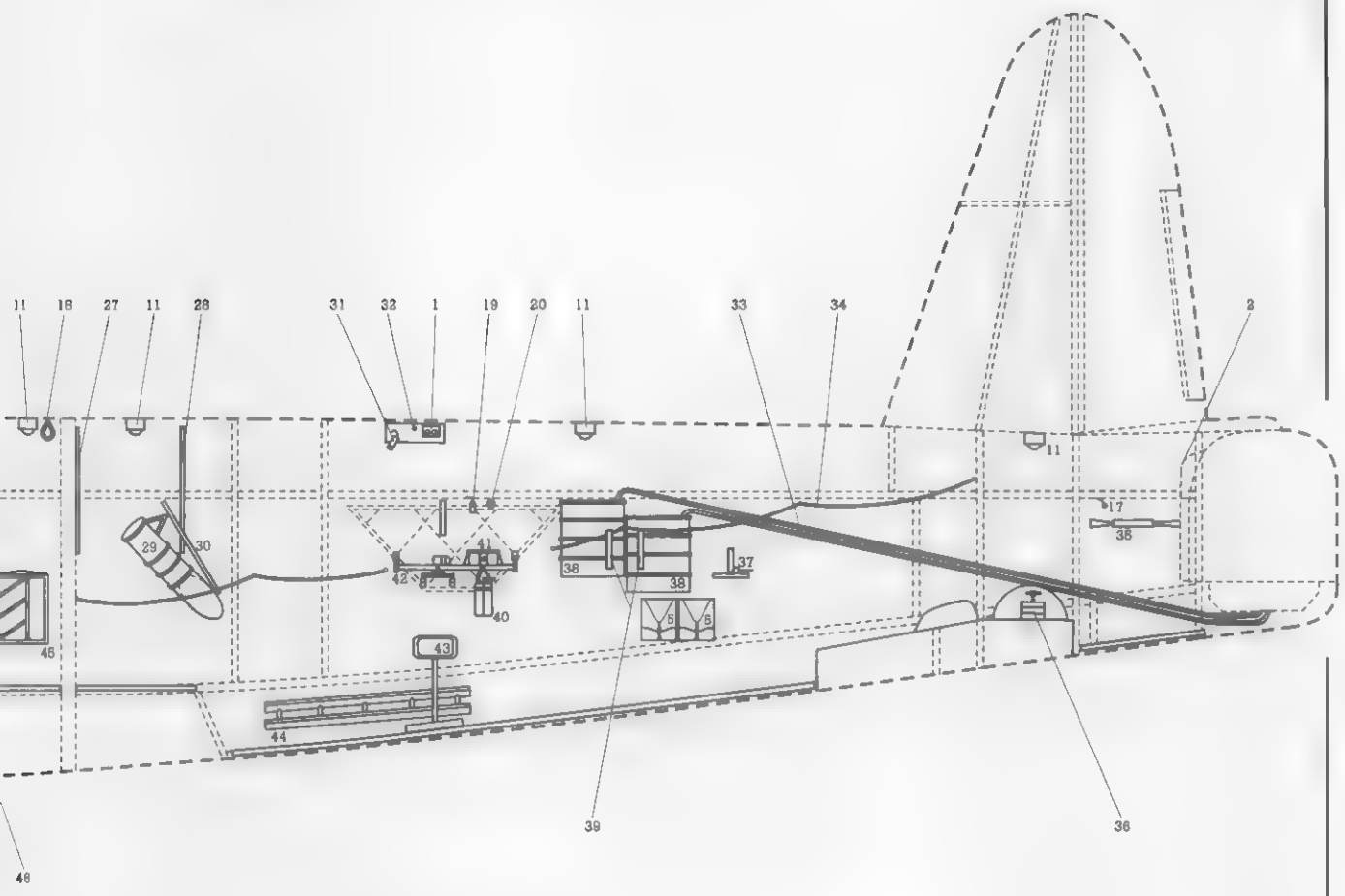
Port side: *63) TR.9F switch 64) Auto-controls main switch 65) Auto-controls main cock 66) Clips for general-purpose and TR.9F or intercommunication telephone and microphone socket 67) Auto-controls attitude control 68) Auto-controls clutch lever 69) Control column spring-loaded locking frame 70) Throttle control levers 71) Landing lamps three-position switch 72) Control column outline 73) TR.9F remote control unit 74) Landing lamps control lever 75) Elevator trimming tabs fine adjustment wheel 76) Rudder and elevator trimming tabs control 77) Slow-running cut-out control handles 78) Pilot's seat outline 79) Hot and cold air intake control lever 80) Auto-controls speed and steering levers 81) Airscrew speed control levers 82) Mixture control levers (not fitted to Mk.X) 83) Throttle and mixture controls friction damper lever.*

Starboard side: *84) Headlamp switch (independent and signalling) 85) Bomb electrical jettison switch (made redundant by item 44 on instrument panel) 86) ASI pressure head heating switch 87) Bomb release indicator and earth fault lamps 88) Navigation light switch 89) Bomb release master switch 90) Bomb container jettison switch 91) Windscreen wiper control rheostat 92) R.3003 shrouded emergency switches 93) R.3003 main switch 94) Bomb loading instruction plate (if fitted) 95) Starboard seat folding footrest 96) Second pilot's microphone and telephone socket 97) Warm air supply outlet and control valve 98) Second pilot's oxygen supply socket 99) Starboard (second pilot's) seat 100) Cockpit roof sun blind stowage 101) Bomb loading instruction plate stowage (if fitted).*

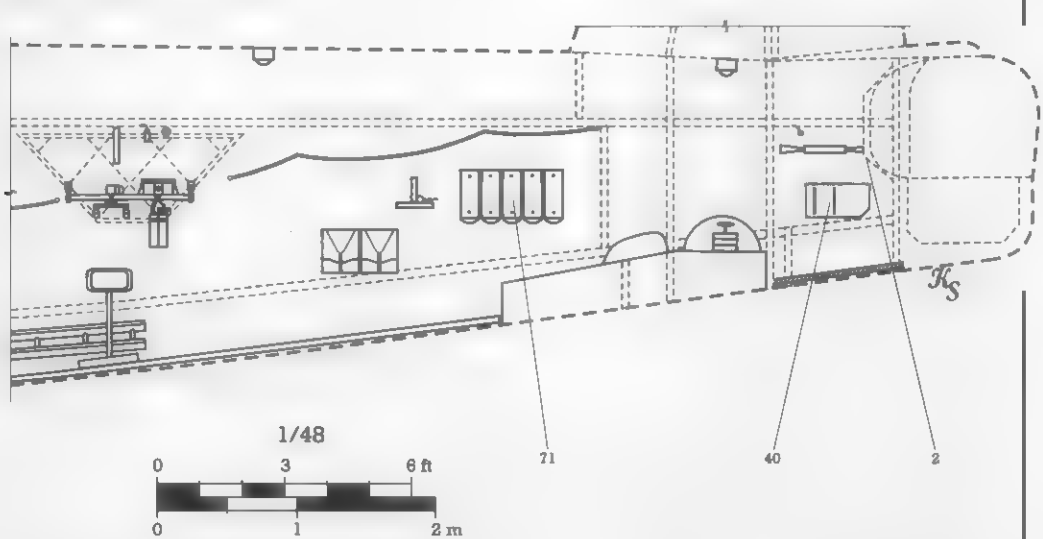
The port side of the pilot's cockpit (the T Mk.10 depicted). Elements of the Mk.VIII automatic flying controls are located on the geodetic construction members, while engine controls are grouped together at the bottom. Rudder and elevator trimming tabs controls are just beside the seat (left). The opposite side of the cockpit was basically the same for all the versions. A 'B' panel with electrical switches was placed under the sliding side window. The starboard folding seat is in the stowed position, permitting clear passage to the wireless operator and navigator's compartment (right).

Wellington fuselage equipment

Starboard side



Mks.IC (late), II, III (early), IV



1/48

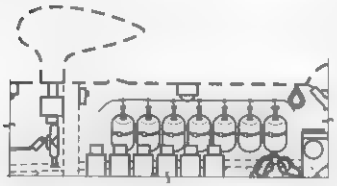
0 3 6 ft

0 1 2 m

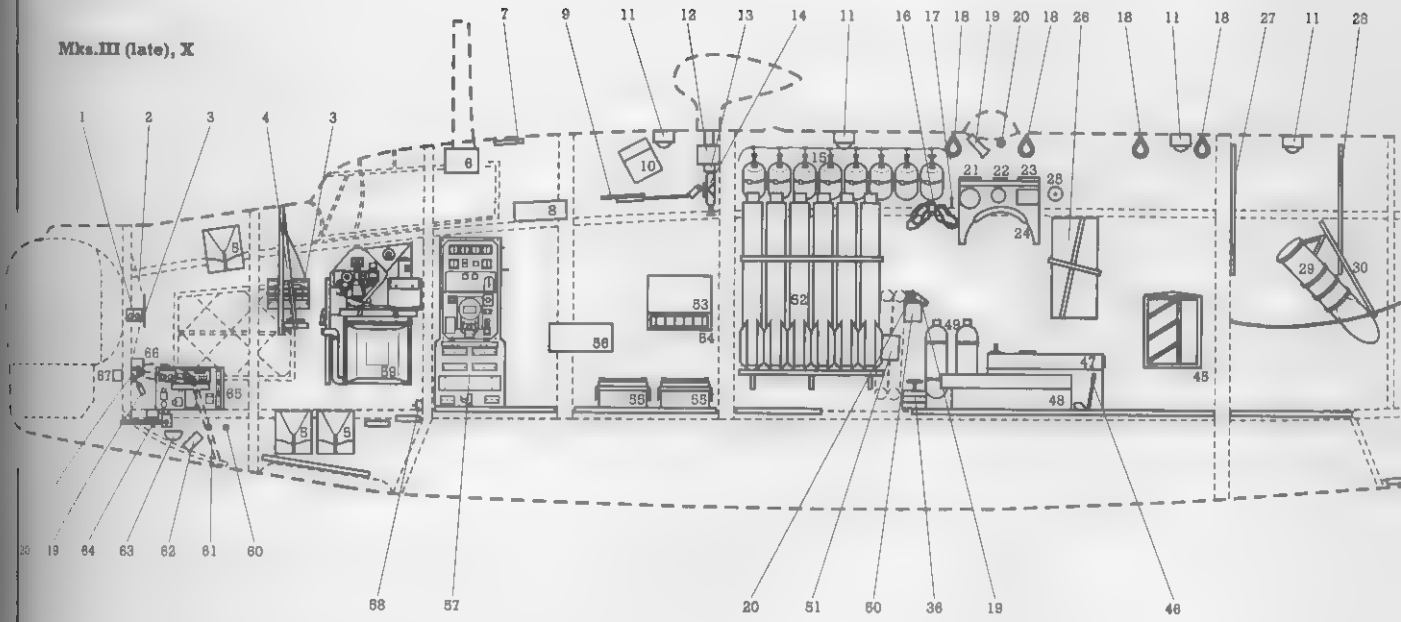
lot's instrument panel 5) Parachute
ocking of flying controls) stowage
r 13) Stowage bag for wing jacking
amp 20) Dimmer switch 21) Sextant
lamps 26) Dinghy emergency pack
ce flare tube guide actuating rod
ess door closing device 36) Ballast
er mounting 40) Ammunition box
Flame float or sea marker stowage
ed air cylinders 50) Flotation gear
Signal pistol cartridge stowage
Switch in series with forward roof
53) Height-and-airspeed computor
ystem 67) Impact switch for engine
1) Life-saving jacket stowages.

Starboard

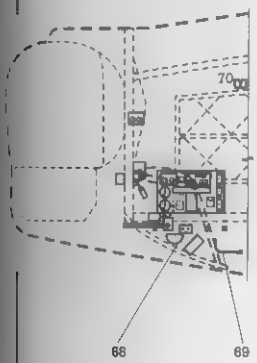
Mks.IA, IC, II (early), III (early), IV



Mks.III (late), X

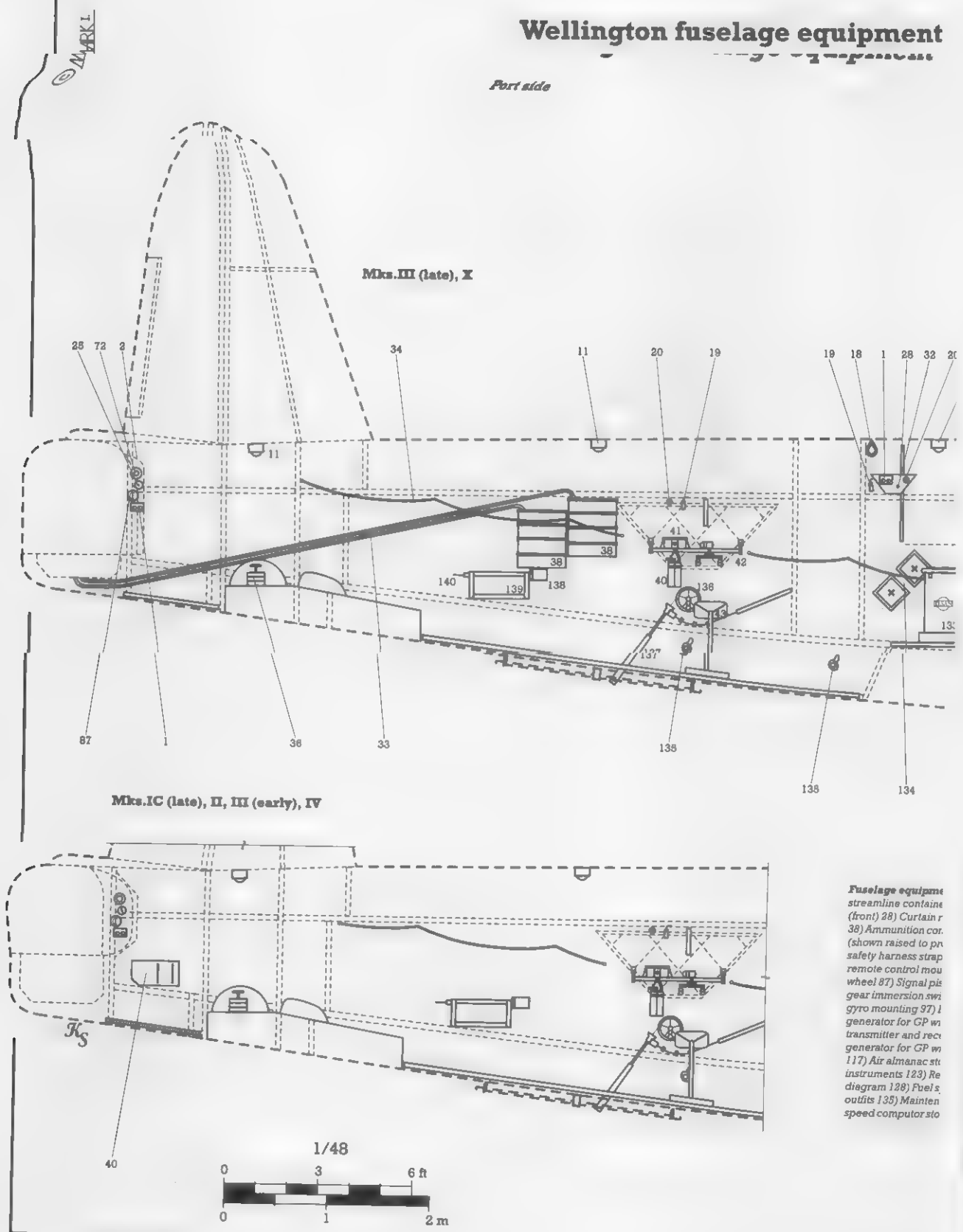


Mks.IA, IC, II, IV

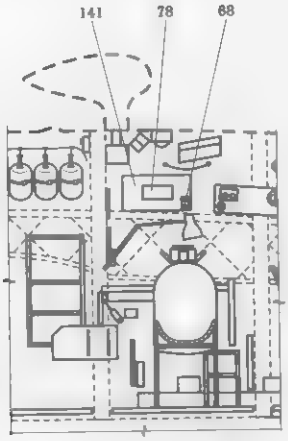


Fuselage equipment - starboard side: *1) Oxygen regulator unit 2) Turret access door 3) Bomb loading chart 4) Pilot's instrument panel 5) Parachute stowage 6) Aerial mounting 7) Crystal monitor mounting 8) R.3003 controls mounting 9) "Nuisance bar" (for locking of flying controls) stowage 10) Stowage bag for miscellaneous diagrams 11) Roof lamp 12) D/F loop aerial mounting and streamline container 13) Stowage bag for wing jacking blocks 14) Fire extinguisher 15) Oxygen cylinders 16) Rope stowage 17) Dinghy manual release 18) Hand grip 19) Lamp 20) Dimmer switch 21) Sextant holder 22) Watch holder 23) Writing pad 24) Starboard section of steadying frame 25) Two-way switch for two rear roof lamps 26) Dinghy emergency pack No. 7 27) Curtain rail (front) 28) Curtain rail (rear) 29) Reconnaissance flare launching tube 30) Reconnaissance flare tube guide actuating rod 31) Intercommunication socket 32) Oxygen socket 33) Servo feed ammunition ducts 34) Hand rope 35) Turret access door closing device 36) Ballast weights and mounting 37) R.3003 starboard aerial bracket 38) Ammunition container 39) Marker beacon receiver mounting 40) Ammunition box 41) Browning 0.303 machine gun 42) Beam gun mounting 43) Beam gunner's swivelling seat 44) Entrance ladder 45) Flame float or sea marker stowage 46) Hand pump 47) Auxiliary oil tank 48) Sextant doom pedestal with hinged top 49) Pneumatic system compressed air cylinders 50) Flotation gear manual operating control box 51) Sextant stowage 52) Reconnaissance flares 53) Chart board stowage 54) Signal pistol cartridge stowage 55) Accumulators 56) Tail unit de-icing system distributor valve and control unit 57) Electrical distributor panel 58) Switch in series with forward roof lamps 59) Starboard seat 60) Pencil stowage 61) Hinged frame (shown raised ⁄ protective position) 62) Writing tablet 63) Height-and-airspeed computer stowage 64) Bombsight 65) Bomb aimer's control panel 66) Gravity switch unit for engine nacelle fire extinguishing system 67) Impact switch for engine nacelle extinguishing system 68) "Call lamp" unit 69) Tail drift sight mounting 70) Navigator's hand compass stowage 71) Life-saving jacket stowages.*

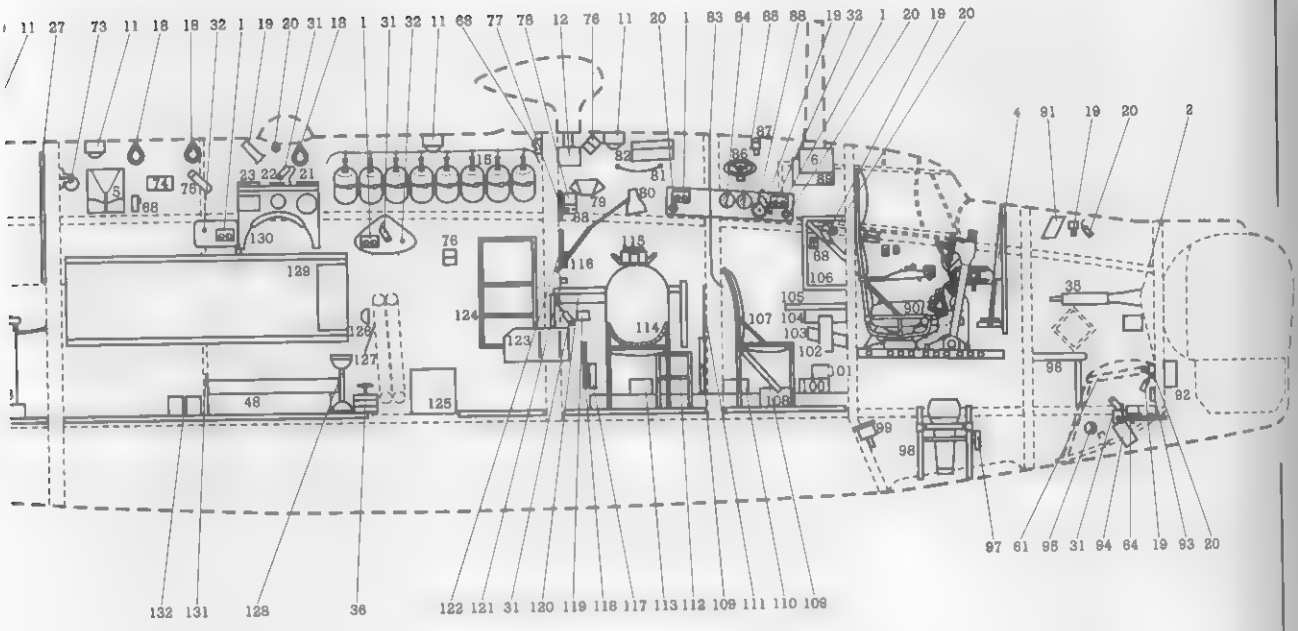
Wellington fuselage equipment



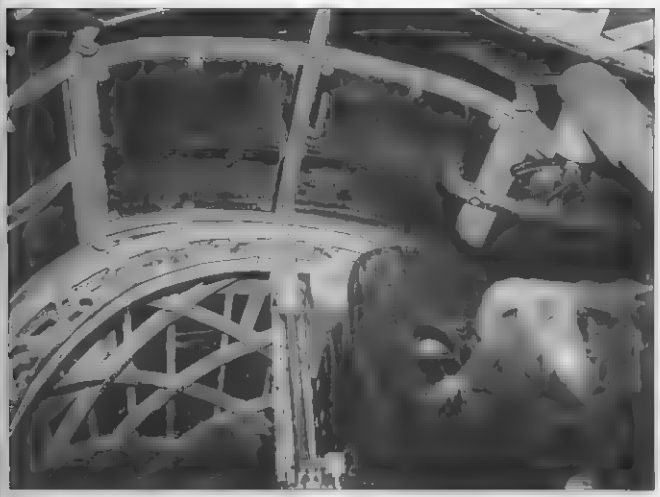
Fuselage equipme
streamline containe
(front) 28) Curtain r
38) Ammunition cor.
(shown raised to pr
safety harness strap
remote control mou
wheel 87) Signal pis
gear immersion swi
gyro mounting 97) I
generator for GP wi
transmitter and rec
generator for GP wi
117) Air almanac st
instruments 123) Re
diagram 128) Fuel s
outfits 135) Mainten
speed computor sto



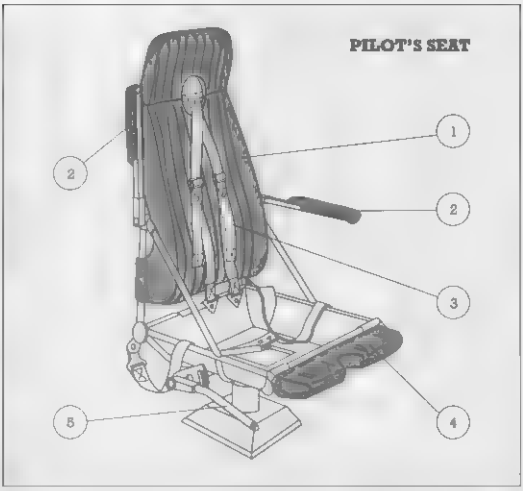
Mks.IA, IC, II, IV



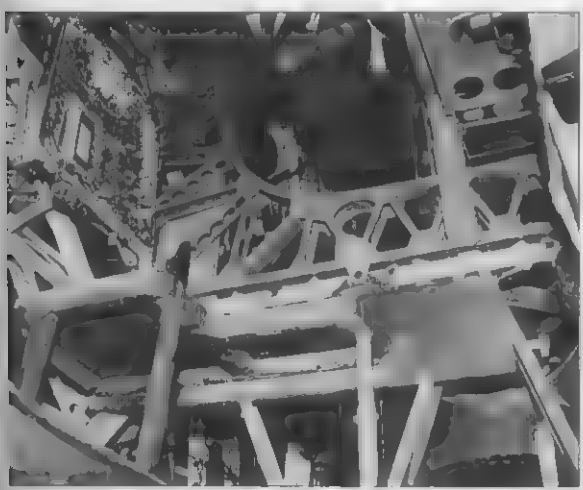
ınt - port side: 1) Oxygen regulator unit 2) Turret access door 4) Pilot's instrument panel 5) Parachute stowage 6) Aerial mounting 11) Roof lamp 12) D/F loop aerial mounting and r 15) Oxygen cylinders 18) Hand grip 19) Lamp 20) Dimmer switch 21) Sextant holder 22) Watch holder 23) Writing pad 25) Two-way switch for two rear roof lamps 27) Curtain rail ail (rear) 31) Intercommunication socket 32) Oxygen socket 33) Servo feed ammunition ducts 34) Hand rope 35) Turret access door closing device 36) Ballast weights and mounting tainer 40) Ammunition box 41) Browning 0.303 machine gun 42) Beam gun mounting 43) Beam gunner's swivelling seat 48) Sextant doom pedestal with hinged top 61) Hinged frame otective position) 64) Bombsight 68) "Call lamp" unit 72) Inspection lamp socket 73) Reconnaissance flare fuzing cable reel 74) Sextant dome clearing material 75) Sextant dome extension link 76) Beam approach wave-change remote control fitting stowage bag 77) Diagrams of permissible damage to aeroplane structure 78) Beam approach wave-change nting 79) Astrograph 80) Navigator's table lamp 81) Hand grip 82) Message slip stowage 83) Armour plating 84) Altimeter 85) Airspeed indicator 86) D/F loop aerial remore control tol mounting 88) D/F loop aerial setting indicator 89) Header tank for general services hydraulic system 90) Pilot's seat 91) Automatic bombsight suppressor mounting 92) Flotation tch unit 93) Camera remote control wedge plate stowage 94) Signalling unit for pilot's steering indicator 95) Camera sight for oblique photography 96) Automatic bombsight azimuth Bombsight wedge plate stowage 98) Camera and mounting 99) Camera motor (wedge plate mounting) 100) HT battery 101) Intercommunication amplifier 102) High-tension motor reless installation 103) Auxiliary header tank for general-services hydraulic system 104) Wireless operator's drawer 105) Wireless operator's table 106) General-purpose wireless iver crate 107) Wireless operator's seat 108) Accumulators (for crystal monitor, intercommunication amplifier, TR.9F and spare) 109) Parallel rule stowage 110) Low tension motor reless istallation 111) Armour plating 112) TR.9F wireless unit crate 113) Aldis lamp stowage 114) Navigator's seat 115) Navigator's compass and mounting 116) Pencil stowages owage 118) Fireman's axe stowage 119) TR.9F remote control fitting stowage 120) Navigator's table and chart stowage 121) Navigator's oxygen socket 122) Stowage for navigational serve ammunition container for front turret 124) Beam approach main receiver and motor generator crate 125) Step 126) Heating system master control knob 127) Fuel cock setting ystem hand pump 129) Rest bunk (in stowed position) 130) Port section of steadying frame 131) Armour plating support post 132) Thermos flask stowage 133) Lavatory 134) First-aid ence ladder stowage straps 136) Trailing aerial winch 137) Trailing aerial outlet tube 138) Impact switch unit 139) R.3003 mounting 140) R.3003 port aerial lead-in 141) Course-and- wage.

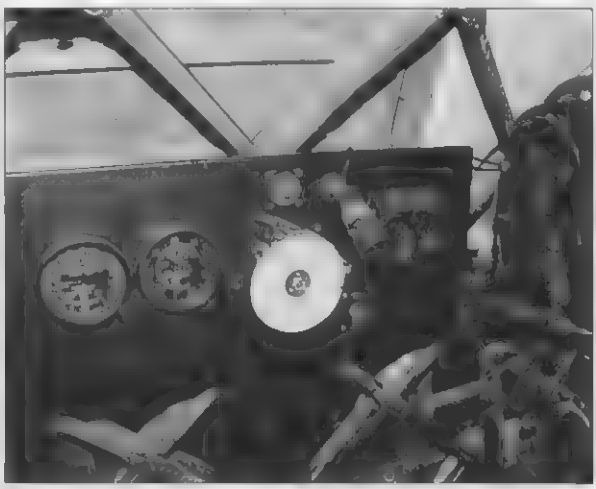


The pilot's cockpit hood looking from the bomb aimer's station. Two outwardly-opening panels in the roof, serving also as a crash exit, could be released by a central lever (above).

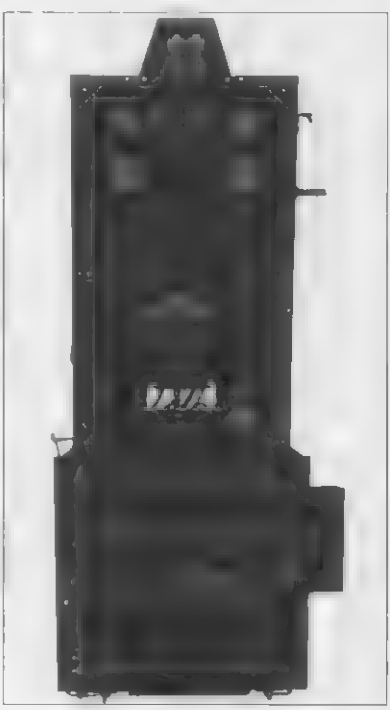


Pilot's seat (for seat-type parachute): *1) Leather back cushion 2) Adjustable arm rests 3) Sutton safety harness 4) Front cushion 5) Seat height adjusting lever.*





Frame No. 12 1/2 separated the foremost fuselage portion from the cabin. The wooden structure in the foreground functioned as steps to reach the cabin floor and the pilot's cockpit platform. A folding seat can be seen on the left (above left). A panel on the port side of the wireless operator's station includes (left to right): an altimeter, an airspeed indicator, a D/F loop indicator and an operator's Mk.VIIIA oxygen regulator (above right).

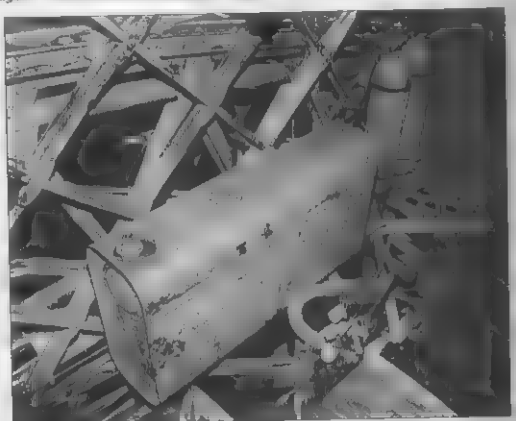


An overall view of the wireless operator and navigator's compartment. The navigator's table and seat, mounted perpendicularly to the aircraft longitudinal axis, was normally protected by armour plating. Baskets for 1-pint thermos flasks (12 in total) were scattered around the cabin. Opposite the operator's station was a two-piece electrical distributor 'F' panel (centre and right). On the panel (an example fitted to the Mk.II is shown on the right) an automatic voltage regulator was located in the centre, while general services fuses were mounted in the lower portion. The indicators at the top are the main plane and auxiliary fuel tank gauges.

The navigator trainees' compartment in the rear cabin of the T Mk.10. The photo above depicts an additional frame panel with a door, and a radio supplies panel, while a DR compass/Air-Position Indicator control panel can be seen in the photo on the right. Top right, a steadying frame encircled the navigator during his observations at the astrodome.

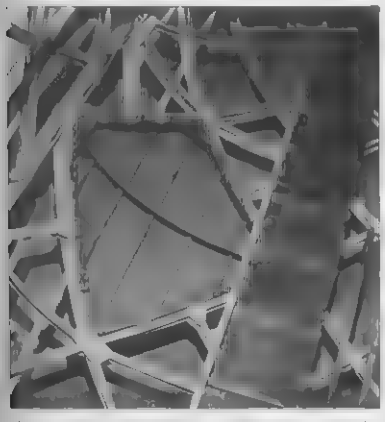
The wing main spar, jointed in the centre, traverses the fuselage. A table with a fuel cock-setting diagram is attached to the spar (above). An early Mk.IA/IC cabin interior with a rest bunk "engaged". The sextant dome pedestal is raised (left).

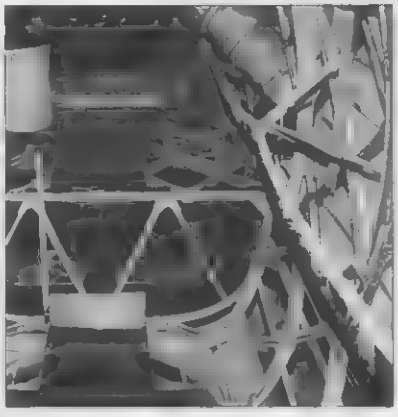
IWM. CH479



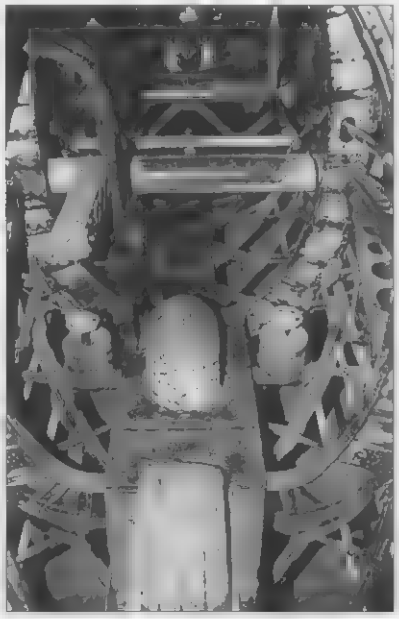
The rear part of the fuselage cabin. The rest bunk and the padded steadying frames are lowered. The flare stowage is on the left while the parachute case is on the opposite side (left). Above, an auxiliary oil tank and a hand pump, and pneumatic system air cylinders.

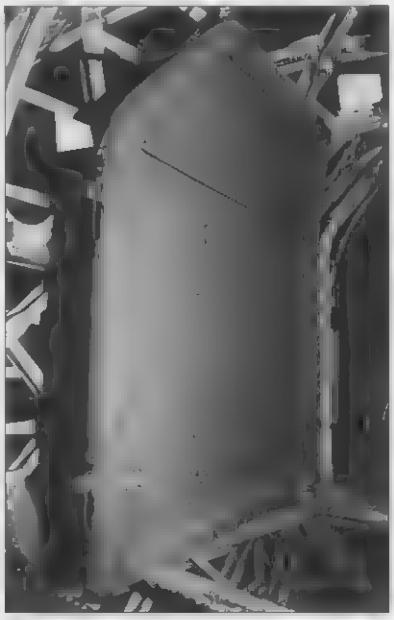
A T Mk.10 rear fuselage, looking aft. Of note are the hand ropes on both sides, the alternative aerial camera position casing near the centre, the IFF unit crate and the flying control rods on the port side (above). The beam gun station, with empty gun mounting frames, and a swivelling seat in the centre (right).





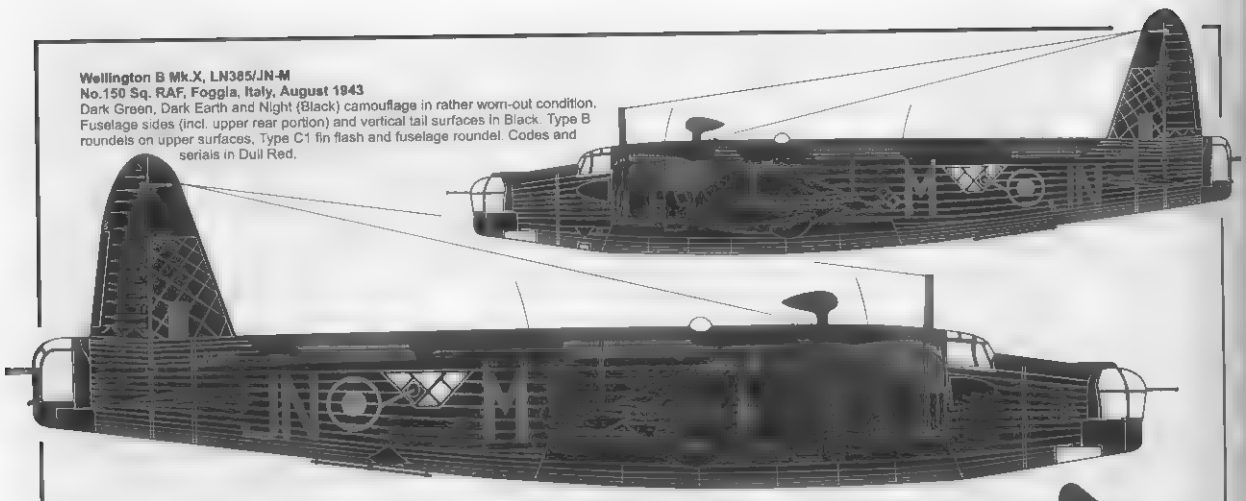
Close-up pictures of the fittings and equipment in the rear fuselage: the plywood walkway and emergency push-out panel in the lower starboard side (left), the floor panel and rear end frame of the bomb bay at station No. III (centre), and an 'Elsan' chemical toilet and first-aid kits on the port side (right). The two boxes with first-aid equipment were also accessible from the outside through a tear-off patch.





A multiple flare chute installed in the circular hatch behind the bomb bay. In B Mk.X aircraft three chute cells were fitted to the starboard side of the hatch, while T Mk.10s mounted a bi-cell flare chute (left). Two pillars, with 17.5lb tail ballast weights, are mounted on each side of the retractable tailwheel recess between two tail frames; the transversal tube encloses the continuous elevator spar (centre). A fabric-covered inner door allowing access to the rear gun turret (right).

Wellington B Mk.X, LN385/JN-M
No.150 Sq. RAF, Foggia, Italy, August 1943
Dark Green, Dark Earth and Night (Black) camouflage in rather worn-out condition. Fuselage sides (incl. upper rear portion) and vertical tail surfaces in Black. Type B roundels on upper surfaces, Type C1 fin flash and fuselage roundel. Codes and serials in Dull Red.



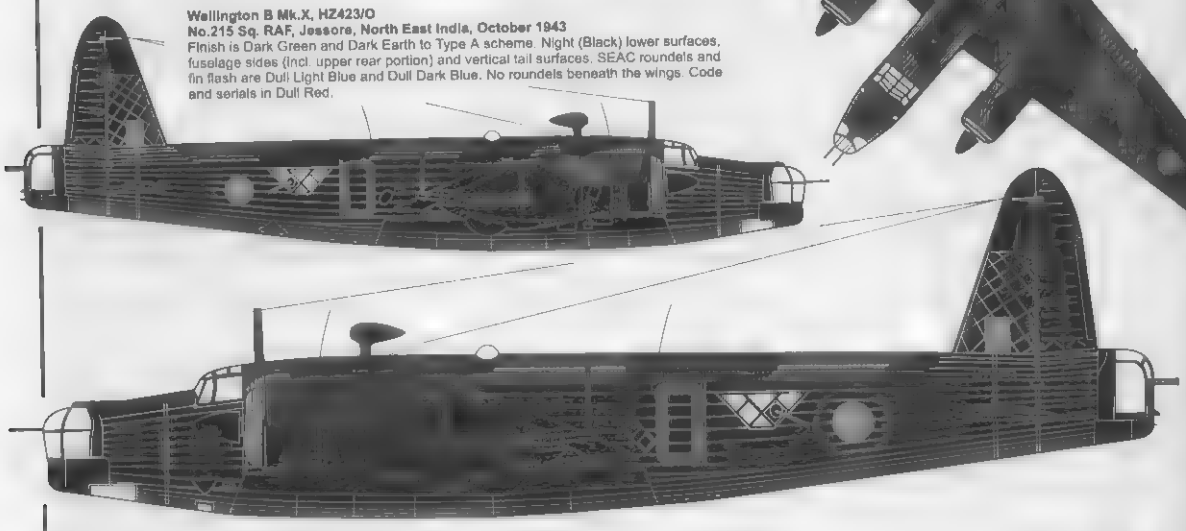
Dark Green
Dark Earth
Night (Black)
Medium Sea Grey
White
Bronze

Dull Blue/Blue
Dull Light Blue
Dull Dark Blue
Dull Red/Red
Yellow

A-scheme for 'HZ423/O' showing SEAC markings

SEAC roundel ■ Dull Light Blue and Dull Dark Blue

Wellington B Mk.X, HZ423/O
No.215 Sq. RAF, Jessore, North East India, October 1943
Finish is Dark Green and Dark Earth to Type A scheme. Night (Black) lower surfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. SEAC roundels and fin flash are Dull Light Blue and Dull Dark Blue. No roundels beneath the wings. Code and serials in Dull Red.



Wellington ■ Mk.X, LN374/M
French Air Force, 1946
Standard Dark Green/Dark Earth finish to A-scheme with Night (Black) undersides, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Lower half of engine cowlings and front part of nacelles painted in Black. French roundels carried in six positions, fin flash of equal-width stripes is Blue (leading), White and Red. Fin code in White.

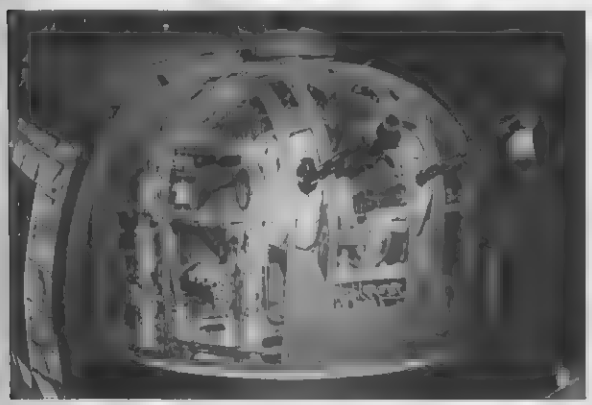
French roundel is Red (outer ring), White and Blue

HS

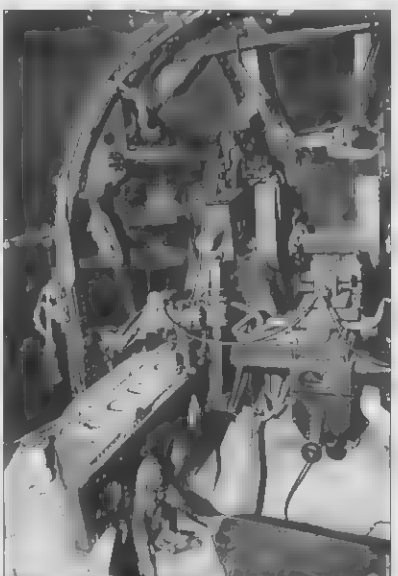
The Vickers-type bow turret, or 'gunnery windscreen' as it was originally termed, of the Wellington Mk.I. The upper transparent sheeting was fixed while the central part was formed by a flexible band running on tracks. There is a vertical opening in the Perspex panel (slightly to the port side, but covered with glazing in this photo), where normally a 0.303" Browning gun was fitted.

Brooklands Museum Trust Ltd., A.118

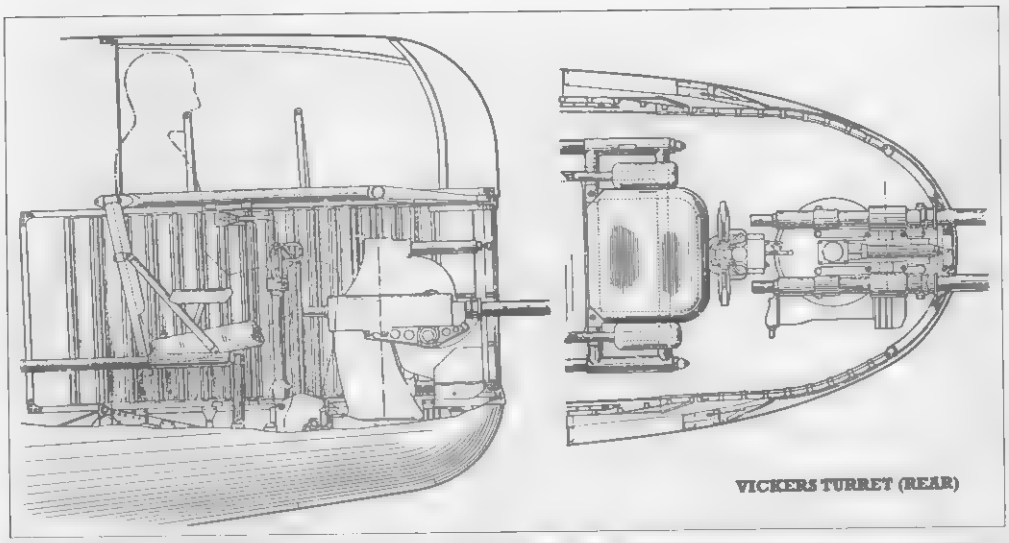
More modern hydraulic-powered Fraser-Nash turrets replaced the Vickers in the next production variants. The FN type 5A turret, depicted below and below right in Mk.IA and Mk.IC aircraft, was armed with twin Browning MGs. Note the cut-out behind the turret allowing for a greater traverse of the cupola.



RAAF Collection



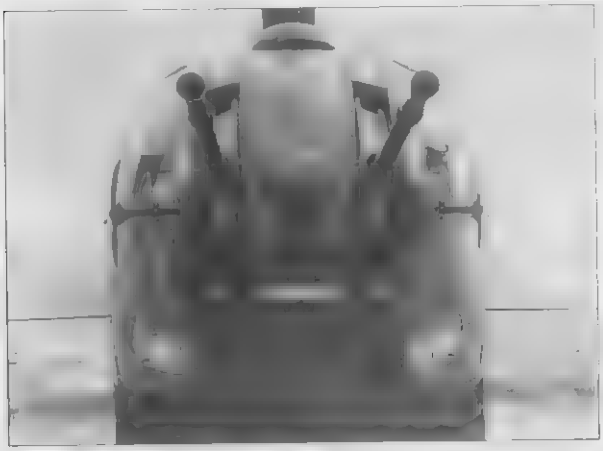
A front gun turret, type FN5A, of the Wellington Mk.X. Access to the turret was from within the fuselage through two-piece doors (above left). The cramped interior of the turret can be observed in the other two photos. The guns were supported in arms and could be raised or lowered by two vertical hydraulic jacks. Ammunition bores were placed on either side, while in the centre was a leather-cushioned gunner's seat with a lap-type safety belt.



VICKERS TURRET (REAR)

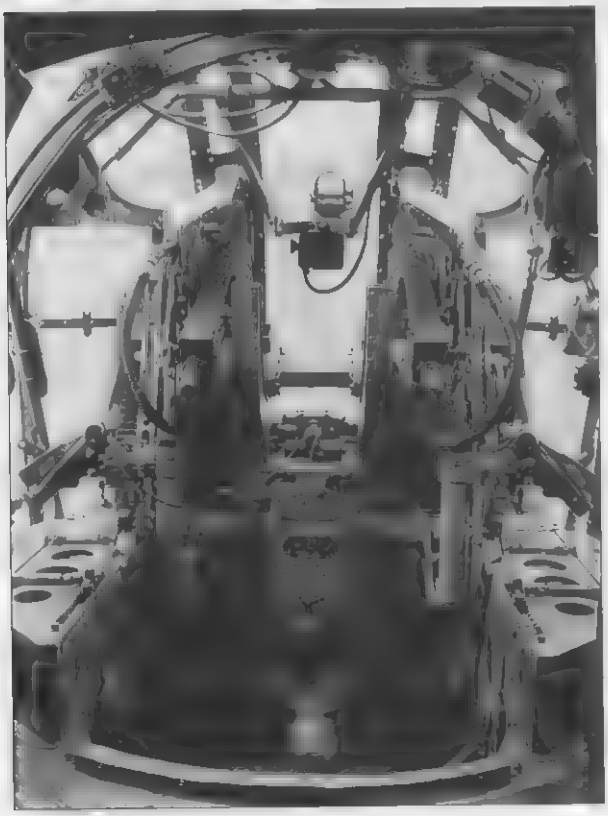
The tail turret of the Wellington Mk.I was designed by B.N. Wallis, embodying Fraser-Nash power-control units. The gunner's seat was fixed to the floor and a self-sealing slot with rubber strips was provided to protect him from the draught of the slipstream as the guns moved.

With its cupola removed the turret framework, hydraulic installation and base armour plating are exposed. Of note is the ammunition belt feed and the three lamp holders of the Bendix signalling system (below).



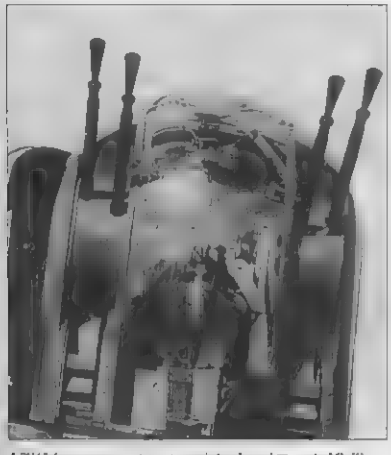
IWM. E(MOS)749

A head-on view of the stern turret, Type FN5A. Two 0.303" guns protrude through slots fitted with draught-excluding shutters (left).



IWM. E(MOS)743

The FN5A rear turret interior fully-equipped. Note the operating jacks, side-mounted control handles and the reflector sight on a V-shaped arm (above and left).



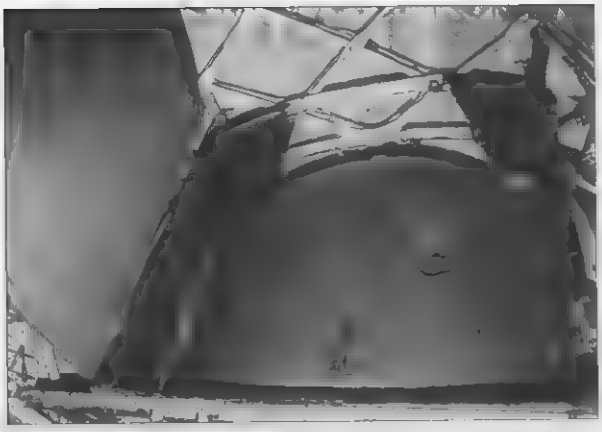
A FN4A four-gun rear turret was introduced ■ early Mk.III aircraft – it was a considerable improvement over the older two-gun station (above).

Brooklands Museum Trust Ltd., FS9/5

The Type FN20 tail turret was a redesign of the FN4 with a servo-feed ammunition supply. It was fitted with 0.35" armour plates ■ improve the gunner's protection. The cut-out in the Perspex panel was due to frost glazing of the cupola (above). A slightly different FN120 unit, with its guns removed, of the B Mk.X (above left).

The gunner could bail out more easily than any other member of the crew when the turret was turned to the beam. Below the FN120 turret cupola ■ an ARI.5022 aerial, installed only on Mk.X aircraft (left).

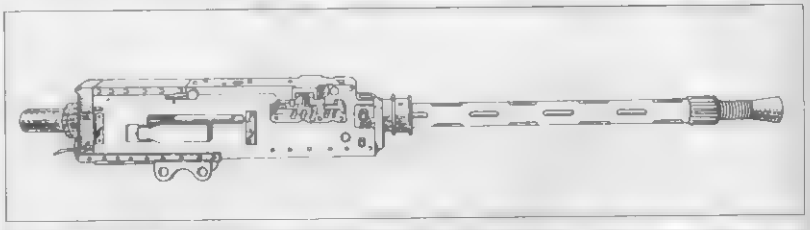
The sliding doors and interior of the FN120. Although the guns and ancillary equipment are removed, the twin-handled control column and seat belt are still ■ place (photos at the bottom).

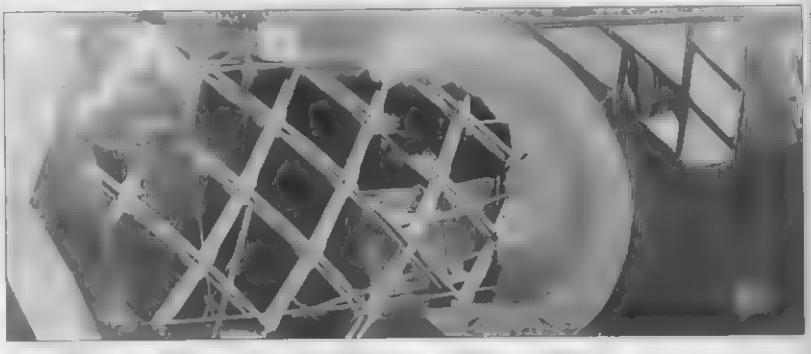


IWM. CH 1433

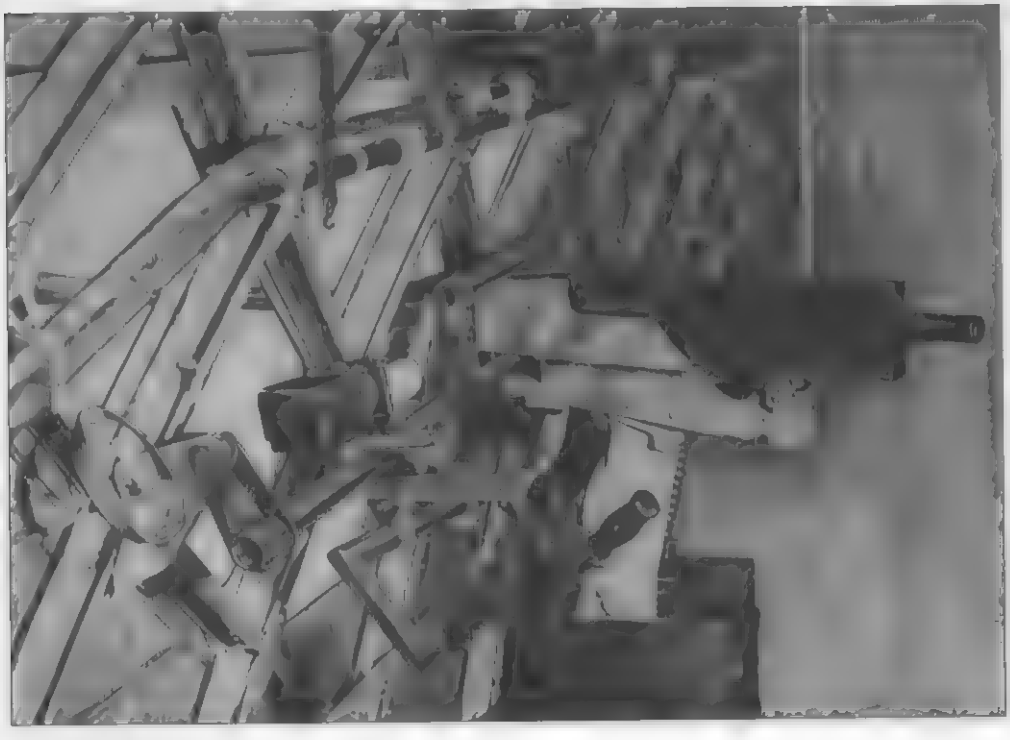
Looking from the inside of the fuselage, an inner canvas-covered door is open while the twin doors of the nose gun turret are closed (above). The cupola, swung round to port side, with turret doors open (right).

The Type FN2S under-turret was fitted only in a limited number of Wellington Mk.IA and Mk.IC aircraft (above).





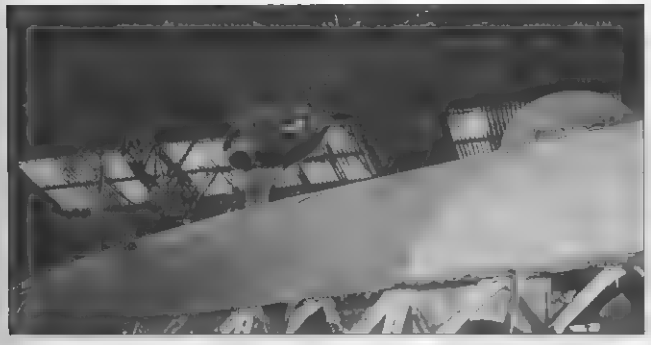
Imperial War Museum

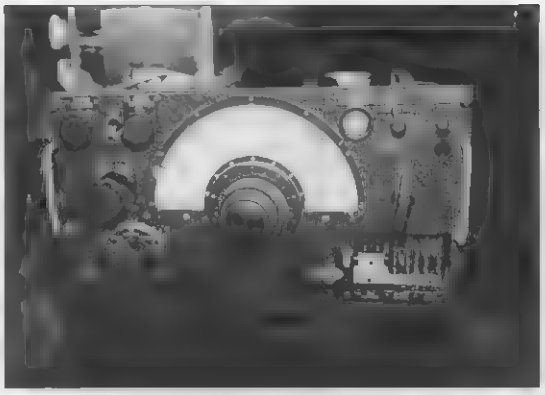


Crown Copyright

A Browning Mk.II gun of 0.303" (7.7mm) calibre, with a modified muzzle attachment developed by BSA (top).
The starboard side of the fuselage, showing the amidships-mounted beam gun window. The gun projected through a flexible sealing cover. Two parachute stowages can be seen behind the geodetic construction (above).

The starboard beam gun station with a Browning gun in place. The gun mounting frame provided for movement of the gun horizontally while, for raising and lowering, the whole assembly was hinged about supporting brackets fixed to the fuselage structure. The box below the gun received ejected empty cartridge cases and links.

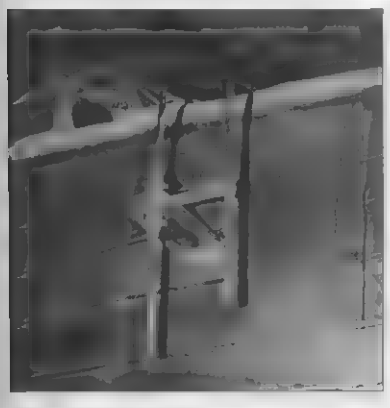


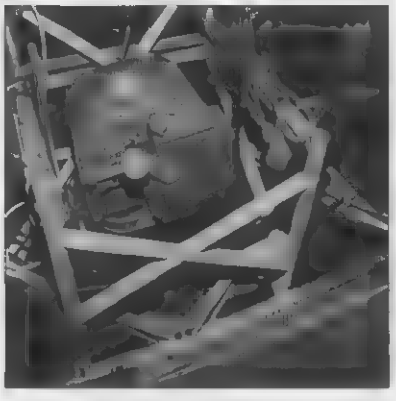


A streamlined container, enclosing the Type 3 loop aerial, and a transparent sextant dome in the fuselage roof were fitted to all variants, except early Mark I aircraft. The downward-stretched aerial belongs to the TR.9F unit (above).

An early installation of the fixed aerial and the D/F loop of the GP wireless set, seen on a Wellington Mk.I (above).
The Marconi R.1155 receiver (top right) and T.1154 transmitter (right) were used in the Mk.III and subsequent variants as basic intercommunication equipment.

Yagi aerials of the Rebecca navigational device installed on a T Mk.10, a blind-flying panel Venturi tube fitted below the fuselage nose and representative of Mk.I, IA and IC aircraft, and an F.24 aerial camera mounted for vertical photography (below, left ■ right).

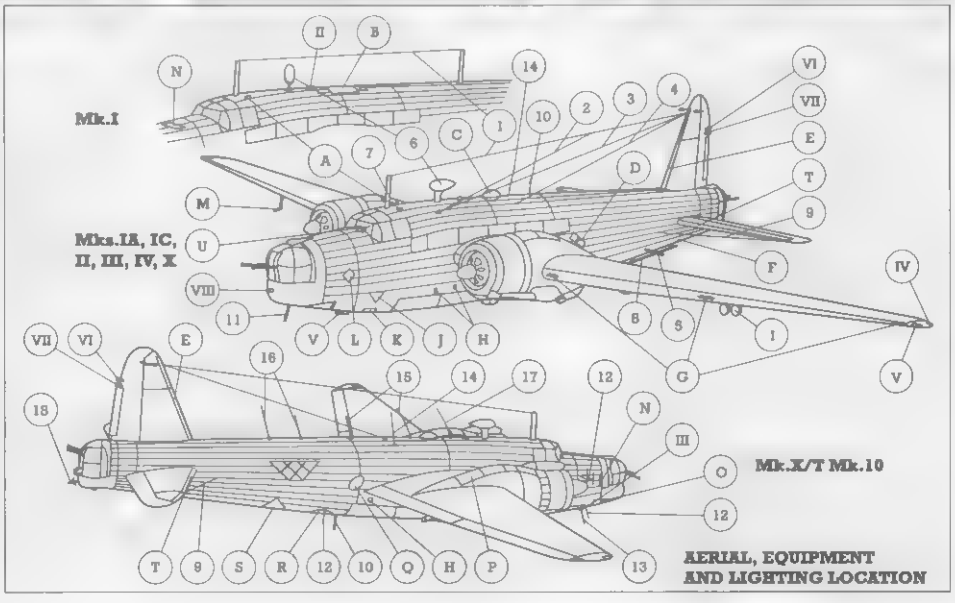




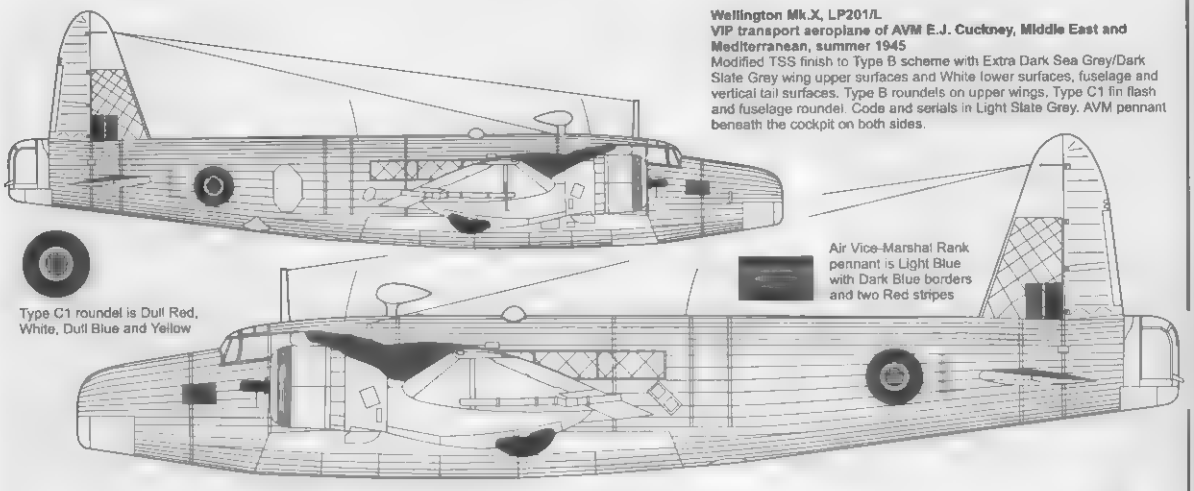
Aerials: *1) General Purpose W/T aerial 2) W/T Intercom (TR.9) 3) W/T Intercom (alternative) 4) W/T Intercom (TR.1196) 5) Trailing aerial 6) D/F loop 7) BA receiver 8) BA di-pole antenna 9) IFF (early) 10) IFF (late) 11) IFF (alternative) 12) Rebecca 13) TBA 14) VHF aerial (some Mk.III, Mk.X) 15) VHF aerial (T Mk.10) 16) Whip aerial 17) Gee 18) ARI 5022.*

Equipment: *A) Signal pistol chute ■ Observation hatch C) Astrodome D) First-aid kit E) Fin de-icing F) Ammunition loading hatch G) Cable cutters (both wings) H) Bomb winch spools J) Hinged panel for oblique photography ■ Sliding panel for vertical photography L) Compass window ■ Pitot tube N) Thermometer O) Drift sight P) Dinghy stowage (starboard side only) Q) Flare chute R) Emergency exit/multiple flare chute S) Emergency exit T) Tailplane de-icing U) Windscreen wiper V) Venturi head.*

Lighting: *I) Landing lamp (port side only) II) Upward identification light III) Downward identification light IV) Formation-keeping light V) Navigation light VI) Rear formation-keeping light VII) Rear navigation light VIII) Forward navigation light.*



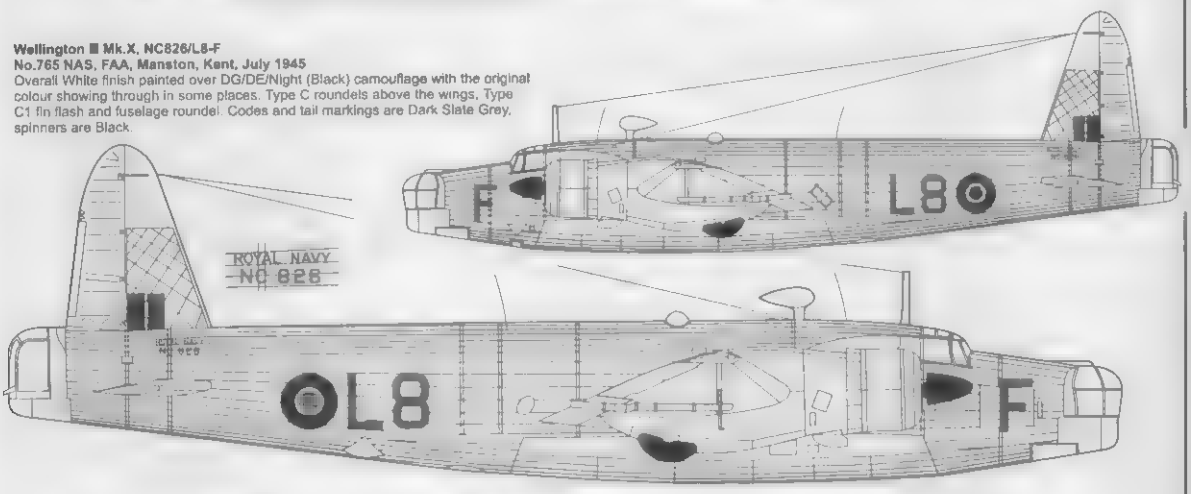
Wellington Mk.X, LP201/L
VIP transport aeroplane of AVM E.J. Cuckney, Middle East and Mediterranean, summer 1945
Modified TSS finish to Type B scheme with Extra Dark Sea Grey/Dark Slate Grey wing upper surfaces and White lower surfaces, fuselage and vertical tail surfaces. Type B roundels on upper wings, Type C1 fin flash and fuselage roundel. Code and serials in Light Slate Grey. AVM pennant beneath the cockpit on both sides.



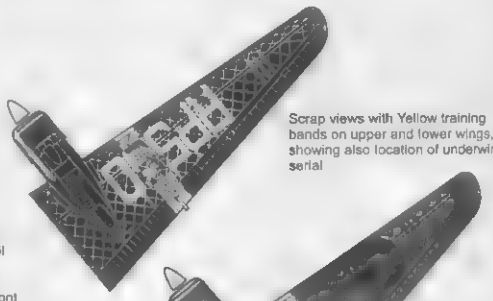
Type C1 roundel is Dull Red, White, Dull Blue and Yellow

Air Vice-Marshal Rank pennant is Light Blue with Dark Blue borders and two Red stripes

Wellington III Mk.X, NC826/L8-F
No.765 NAS, FAA, Manston, Kent, July 1945
Overall White finish painted over DG/DE/Night (Black) camouflage with the original colour showing through in some places. Type C roundels above the wings, Type C1 fin flash and fuselage roundel. Codes and tail markings are Dark Slate Grey, spinners are Black.



Dark Green
Dark Earth
Extra Dark Sea Grey
Dark Slate Grey
Light Slate Grey/Grey
Night (Black)
Medium Sea Grey
White
Bronze
Dull Blue
Dull Red
Yellow



Scrap views with Yellow training bands on upper and lower wings, showing also location of underwing serial

Wellington T Mk.19, RP550/FMB-Y
No.201 AFS, Swinderby, Lincolnshire, January 1949
War-time camouflage of Dark Green and Dark Earth to Type A scheme. Night (Black) undersurfaces, fuselage sides (incl. upper rear portion) and vertical tail surfaces. Type B roundels above the wings, Type C1 fin flash and fuselage roundel. Spinners and bands on fuselage and wings are Yellow. Codes and serial numbers in White. Serials repeated under the wings reading from the front under the port wing and opposite way under the starboard; parts of the numbers placed on Yellow stripes painted in Black. Inscription on tail sides in Grey.

Colours and markings

The Wellington was among the first "Expansion Programme" aircraft to adopt a newly promulgated Land Scheme camouflage pattern. In June 1936 sets of drawings, the Air Diagrams, were issued by the Air Ministry in AP.970 to aid aeroplane manufacturers. An AD 1157 drawing entitled 'Camouflage Scheme for Twin Engine Monoplanes – Heavy Bombers' appertained to the Wellington and prescribed a disruptive pattern of Dark Green and Dark Earth on undersurfaces. Two standard schemes – A and B – were to be used, one being a mirror image of the other. Initially, the A-scheme was applied to aircraft with even serial numbers and scheme B to those with odd numbers, but there were some exceptions to the rule. As evidenced by photographs, some later production Wellingtons used another scheme, based on Type B, with the same colour divisions but having the colours transposed.

The sole B.9/32 prototype, the 'K4049', was delivered in the simple peacetime colour of Aluminium all over, with bright Type A roundels in six positions (wings 65" in diameter and fuselage 50"). Serials in large wide characters (30" high) appeared beneath the wings, reading in opposite directions on port and starboard sides. They were painted in Black, as were their smaller 8" high reproductions on the rear fuselage and on the rudder. For the Hendon Air Display in June 1936 the prototype had New Types Park number '7' (40" high) painted in Black on the fuselage – on the left-hand side of the roundel on port side and on the fuselage nose on starboard side.

Early production camouflaged aircraft wore 1:3:5:7 proportioned Type A1 roundels on the fuselage and above the wings (of 49" and 63" diameter, respectively), in dull colour shades. Serial numbers were presented on the rear fuselage, in front of the tailplanes (8" high Night (Black) letters and numbers) and beneath the wings (48" White figures); the latter always read from the tip of the wing towards the fuselage. As the Munich Crisis deepened in September 1938 the original wing and fuselage roundels were painted out and replaced by two-tone Red and Blue roundels. Usually the Yellow outline of the A1 roundel was painted over by camouflage colours, thus reducing its diameter. In April 1939 Air Ministry Order A.154/39 set out aircraft identification markings introducing squadron identity and individual code letters which were applied in 48" high Medium Sea Grey characters. There was no rule for the style of lettering to be used and so variations emerged. A Type B roundel, 64" in diameter and with 1:2.5 proportions, was carried on wing upper surfaces, while a Type A roundel (50", 1:3:6 for radii) was newly applied on undersurfaces. From the outbreak of war serials were painted out from the undersides of all operational aircraft and squadron code letters were changed. At that time a new colour for lower surfaces was introduced – Special Night RDM2. Unlike the original Night (Black), which was in fact a very dark Blue-Grey, Special Night had a "sooty" appearance and was used until late 1942, when it was replaced by Night (Black) once again. In December 1939 alterations to national markings were made in AMO A.520, which ordered Type A roundels for the fuselage sides and deleted roundels from wing undersides. However, these changes were not carried out uniformly within the units and resulted in the appearance of both smaller and larger roundels on the fuselage (35", 45"). Many aircraft in service also retained their underwing roundels as late as the autumn of 1940, while new machines followed the orders and were marked correctly.

In May 1940 a Signal X.485 was issued, prompting the addition of a Yellow ring to the fuselage roundel and the application of tri-colour vertical stripes on the fin (Red, White and Blue of equal widths). As no details were provided, different interpretations were made of both, including a thin or wide Yellow outline to the roundel, stripes extending the full height and chord of the fin or, conversely, small and narrow stripes near the leading edge of the fin.

In mid-August the Air Ministry ordered a standard form of fin flash, with 8" wide and 27" high stripes (Red stripe leading), and the strict usage of a correctly proportioned Type A1 roundel on the fuselage. Coincidentally, a new Temperate Land Scheme was introduced which, in case of the Wellington, did not entail any colour changes, although the underside Black colouring was extended up the fuselage sides (to three quarters of its height) and the side surfaces of the fin and rudder. Once again, no precise instructions were given as to exactly how the colour was to be extended, thus resulting in variations between squadrons. This application produced both a "scalloped" or less "wavy" camouflage demarcation line on the fuselage. "Wavy" boundaries could also be seen on the leading edges of the wings and tailplanes of some Wellingtons. The rear upper portion of the fuselage remained camouflaged in DG/DE. The serial number colour was also affected and sometimes it was left in Black on a background of original camouflage or it was painted over and applied either in Medium Sea Grey or Red. With so many changes consolidation was necessary and in December 1940 AMO A.926 was released standardizing aircraft camouflage and recognition markings.

From May 1942 a Type C1 roundel (of 36" diameter) was introduced to the fuselage and a new form of fin flash was applied at the fin base (36" x 24"). Some aircraft also wore 54" roundels, while others were applied with a fin flash of incorrect dimensions (24' x 24'). Serial numbers and code letters were to be Dull Red (8" and 48" high respectively), with the former marked either in front of the tailplane or immediately above it. Wellingtons belonging to training units carried, as an alternative to code letters, large numerals approx. 48" high, painted in White or Dull Red. All the changes were confirmed by AMO A.664 issued in July 1942. May of that year also saw another extension of the Black colouring over the rear upper portion of the fuselage, with a "wavy" demarcation line running out to the leading edge of the fin. This line on fuselage sides gave way to a straight line as of July 1942, but both types could be subsequently seen in service.

SEAC aircraft had their markings modified using only two colours for their insignia, Dull Light and Dark Blue. Wing roundel diameter remained the same while that of the fuselage was 54". Serial numbers and single code letters were Dull Red.

Wellingtons under RAF Coastal Command wore a Temperate Sea Scheme, consisting of Dark Slate Grey and Extra Dark Sea Grey on upper surfaces, and White on wing undersurfaces, fuselage sides (including the rear upper portion) and vertical tail surfaces. Glossy White was used for the lower surfaces of the wing, tailplanes and fuselage, while a matt finish was applied to the other surfaces. The boundary between upper and lower surface colours was initially of a "wavy" type and was later superseded by a more common straight demarcation line. Aircraft re-allocated from Bomber to Coastal Command retained their TLS camouflage for a couple of months (e.g. Nos.304 and 311 Sq.), but were repainted in due course. Roundels were carried only on wing tops and fuselage sides, the former being of Type B (64" in diameter) and the latter of Type C1 (36"). Fin striping followed general RAF practice. Serials and code letters were painted either in Light or Dark Slate Grey and were 8" and 48" high respectively, although sometimes narrow 54" high codes were used. From January 1943 code letters were removed from coastal duties aircraft, leaving only an individual aircraft letter on the fuselage.

The few Wellington medium bombers serving with the FAA either retained the night bomber camouflage, or received a TSS scheme, or they were repainted in White all over. The words 'ROYAL NAVY', in 4" lettering, were added above the serial number which was placed on the rear fuselage below the fin; both were painted in Light Slate Grey (although Dark Slate Grey was also used). Squadron codes, when carried, were 36" high and located on both sides of the fuselage, with the roundel in between (e.g. L●8), and an individual letter was carried on the nose. When only one aircraft letter was applied, it was positioned either behind the wing trailing edge or on the nose and painted in White, or Light or Dark Slate Grey. Its height varied from 48" to 54".

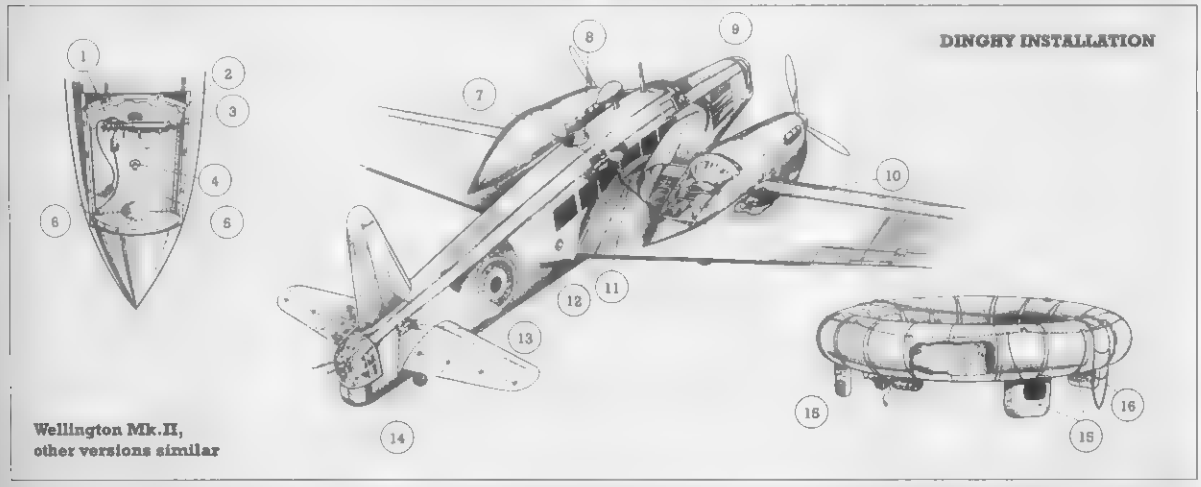
The majority of aircraft that survived the war and were used as trainers retained their night bomber camouflage, although from mid-1945 White serials (36" or 48" high) were displayed under the wings once again. In 1946 a four-letter code system was promulgated. The codes in White were carried on fuselage sides, with the roundel providing the division (e.g. FF●JL, FFK●H). The last letter, representing an individual designation, was usually repeated on the nose. The code letter height varied from small 16" to large 18" figures. Yellow bands, approx. 36" wide, were introduced and encircled the rear fuselage and were chord-wise around each wing.

In May 1947, an order A.413/47 set out new colour schemes and markings. Aircraft were painted Aluminium all over, Yellow bands were retained and bright Type D roundels (of 1:2:3 proportions) replaced Type B and C1 roundels and fin flashes. Their dimensions were: fuselage 36", upper wing 54" and lower wing 36", while the fin flash was 24" x 24", with three equal-width stripes. Codes and serials were painted in Black, 36" and 8" high respectively. A Black 'anti-dazzle' panel forward of the windscreen appeared on some aircraft.

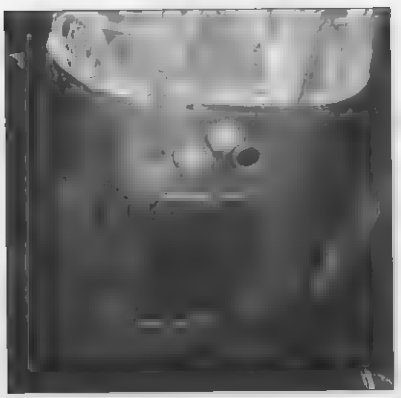
On many war-time machines the leading edges of the wing, tailplane and fin were treated with a special flexible Yellowish Brown protective paint. Engine collector rings and exhaust pipes were Golden-Bronze. The propeller blades were Black with 4" wide Yellow tips. Spinners were Dark Green or Dark Earth on night bombers while those of FAA aircraft were White.

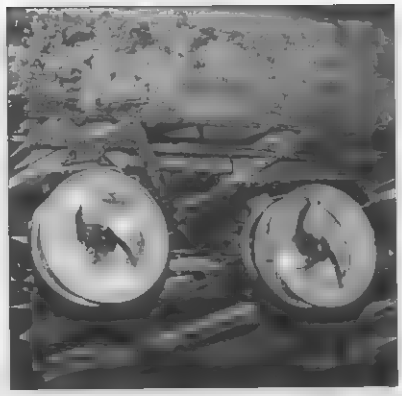
The airframe interior, geodetical construction, flap interiors, undercarriage legs and wheel disks were Aluminium, with fuselage bulkheads and stringers painted in Dark Grey. The fabric cover of the fuselage interior was Red-Brown in appearance, while wooden panels (bulkhead doors) and tables were varnished timber. The fuselage walkways were either painted Black or kept their natural wooden colour. The cockpit floor, pedals, control column, internal canopy framing and inner sides of turret doors were originally painted in Grey-Green, but could have been repainted in Black post-war. The turret interiors, outer sides of turret doors, wheel wells, bomb bay (including the inner side of their doors) and the inside of the undercarriage door covers were matt Black. The crew seats, leather cushions, control column hand-wheel, instrument panels, radio equipment, bombsight and oxygen bottles were Black. The folding rest bunk was made of canvas.

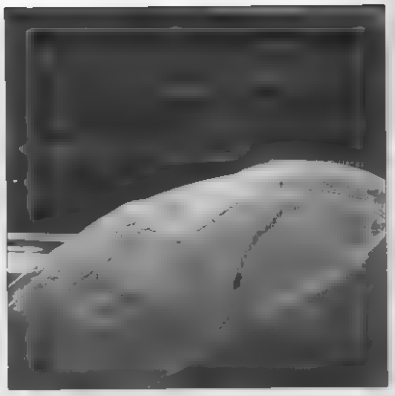
Squadron badges were carried only on the aeroplanes of No.9 Sq. for a while before war broke out. Various individual markings, "nose art" and inscriptions emerged during the war and were painted on the fuselage nose, under the cockpit, or in some cases on the fin. The AID markings (inspection codes, stamps, doping scheme codes and W/T bonding markings) were carried on the starboard side of the fuselage, rudder and fin, and on the lower surfaces of the wing, tailplane, ailerons and elevators; they were painted in White on camouflaged areas, and in Red or White on the Black background. Stencils on Aluminium painted aircraft were Black and Red. ■



Dinghy installation and exits for use: 1) Electrical operating head 2) CO_2 cylinder 3) Disconnector 4) Anchoring cord attachment 5) Release cable 6) Plug for electric lead 7) Central release 8) 2nd pilot, observer and beam gunner's exit 9) Pilot and front gunner's exit 10) Electrical immersion switch 11) Release cable (on wing surface) 12) Painter cord (on wing surface) 13) Tear-off patches 14) Rear dinghy release 15) Stabilizing pocket 16) Rope ladder.

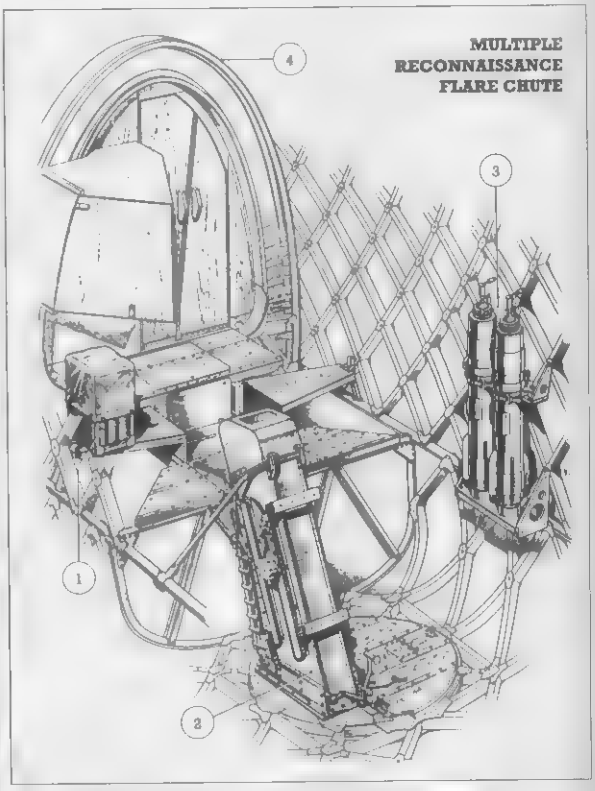






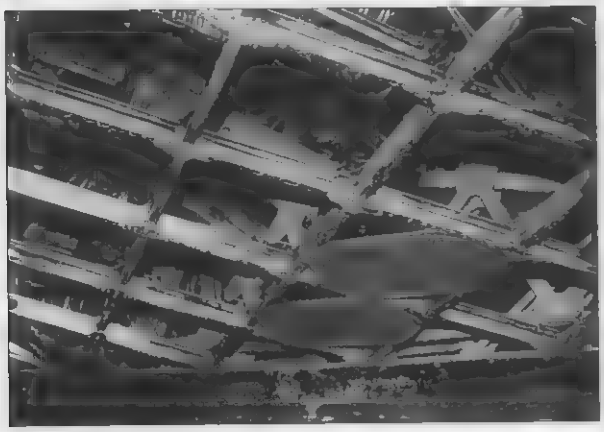
The main entrance door was hinged on the starboard side and opened inwards. Mk.III/X aircraft had three downward identification lights (from the left, green, amber and red) placed just in front of the hatch (left). Two 350W retractable landing lamps were mounted near the leading edge of the port outer main plane (centre). A starboard navigation light and associated inspection cover (right).

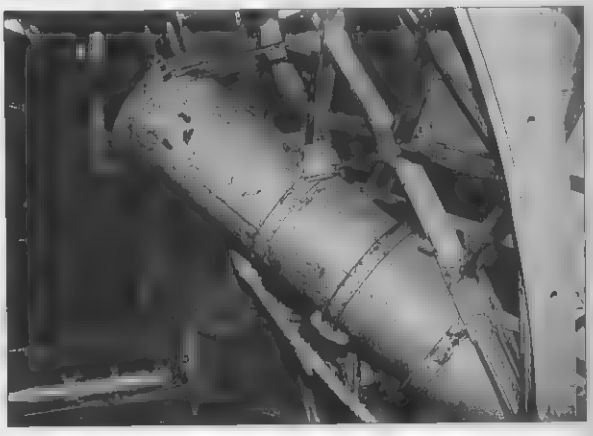
A Mk.IXA Course Setting Bombsight fitted to the port side of the bomb aiming station (above). The nose of a Mk.IA aircraft shows transparent panels and supporting structural members. A single downward identification light was fitted to early aeroplanes (below).



***T Mk.10 bi-cell flare chute:** 1) Stowage for nine flame floats 2) Launching chute 3) 4.5" reconnaissance flare stowage 4) Trailing edge frame No.50 1/2.*

Two forced-landing flares could be housed in diagonally mounted chutes in the port inner main plane (not fitted to later Mk.III and Mk.X aircraft), while a single launching tube was fired amidships on the starboard side of the fuselage (below left and below, respectively).



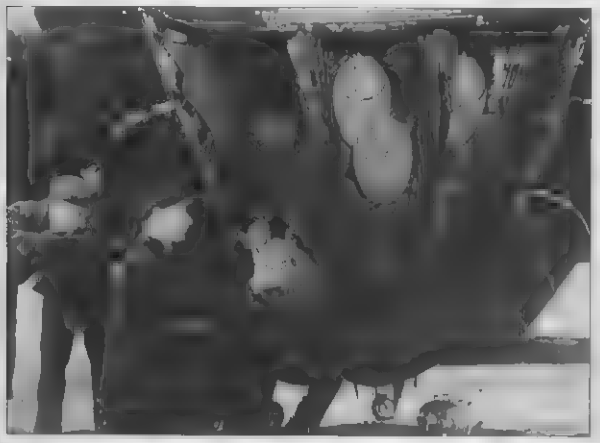


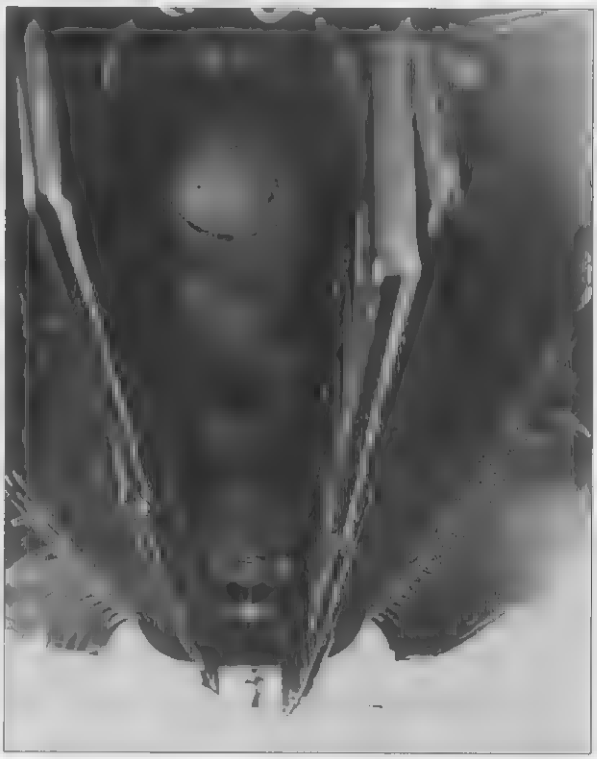
Typical pre-flight feverish "swarming" around the Wellington Mk.IC, R1593/OJ-N, of No.149 'East India' Squadron. Four 500lb GP bombs (out of a total of nine) are yet to be loaded. Note the crudely painted crew insignia of a drunken firefly below the cockpit.

IWM CH2705

According to the instructions the centre cell had to be loaded first, as shown in the photo below right; three 500lb bombs are already in place. Below, 250lb SAP bombs are being hoisted to the upper tier. Note the canvas screens and inflatable bags above the bombs.

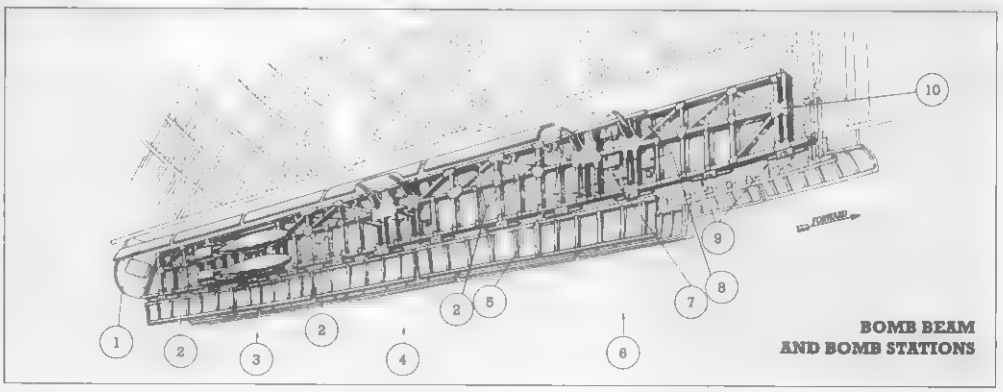
Mike Hooks





Brooklands Museum Trust Ltd., T539/17

A special bomb carrier was used with 1,000lb bombs. Here a GP bomb is being wound up using a standard winch handle. No.A.954, with other 250lb bombs waiting to be loaded (above).



BOMB BEAM AND BOMB STATIONS

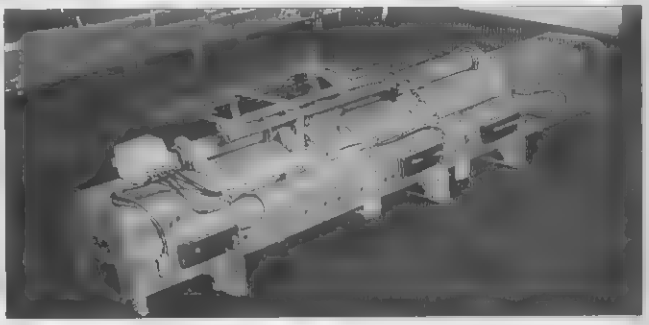
***Starboard bomb beam and cell:** 1) Rear panel 2) Winches 3) Bomb station Nos.9 and 10 4) Bomb station Nos.8 and 17 (crutches raised) 5) Bomb crutches 6) Bomb station Nos.7 and 16 7) Bomb slips 8) Electro-mechanical release units 9) Bomb door jacks 10) Braced girder.*

Mike Hooks

Bomb bay construction details – note the inspection window in the rear panel.

Jarosław Pepeła

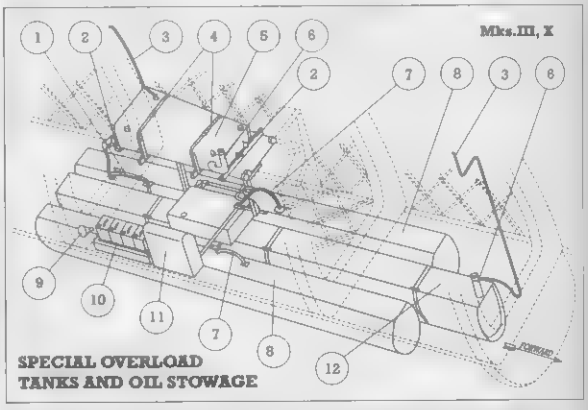
250lb bombs are being loaded in the photo at the top of the page. Because of short winch cables for loading the front three bombs, they had to be hoisted from a trolley. A double row of doors was mounted in each outer bomb bay, whereas the centre cell had only a single row. The external supply socket panel can be seen above the doors (top). The bomb winch spools, marked in Red, were on the fuselage sides just above the bomb bay outer doors (above left). Various pieces of equipment and armament prior to their installation inside the Wellington (above right).



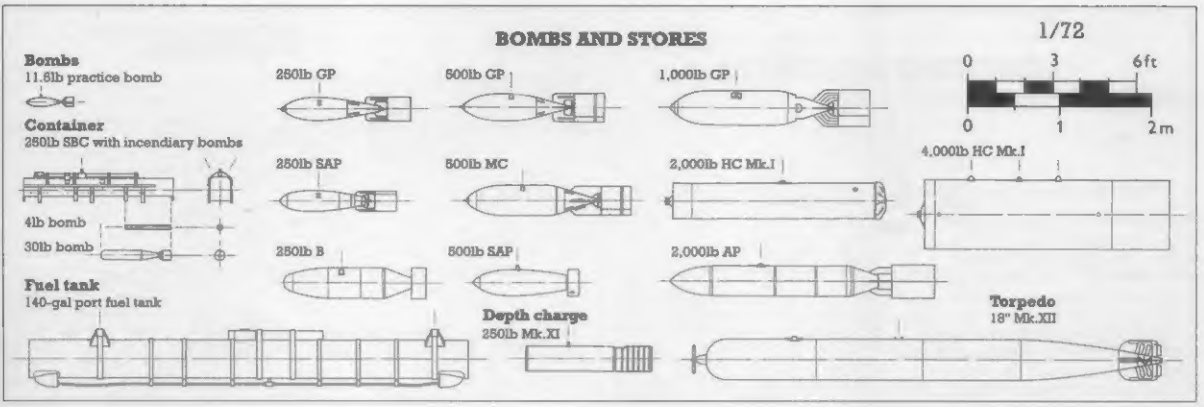
Polish armourers and their 500lb "little present" with an appropriate inscription on the shell of the bomb (left). A Small Bomb Container was used to carry incendiary bombs with magnesium, phosphorus or petrol/flame filling (above).

IWM, CH18450

Some of the bombs utilised by the Bomber Command Wellingtons: 500lb and 1,000lb GP, 2,000lb and 4,000lb HC bombs. The last one was dubbed the "Cookie" or the "Dangerous Dustbin".



Long range tank installation: *1) Feed pipe 2) Outer bearer 3) Vent pipe 4) Inner bearer 5) Rest bunk tank 6) Filler neck 7) Connection to outer tank Outer tank 9) Oil filler funnel 10) Oil canisters 11) Auxiliary oil tank 12) Centre tank.*



Armament and equipment

The design of the Wellington was well suited to its primary role as a medium bomber. Various bombloads could be carried in the fuselage bomb-bay, which was divided longitudinally into three cells, each with two tiers for bombs. A combination of either 500lb GP, MC or SAP bombs, or 250lb AS, GP, SAP, B or I.C bombs, could be attached to slip mechanisms, arranged in three vertical pairs in each bomb cell, up to a total weight of 4,500 lb. By the installation of special bomb carriers in the outer cells 1,000lb, 2,000lb AP or HC bombs, or 250lb SBC containers (for incendiary bombs) could be carried. Smoke Curtain Installation canisters (presumably a cover-up for chemical weapons), 1,500lb parachute-retarded 'M' sea mines or 250lb Mk.XI depth charges could also be fitted in the same positions. When modification Type 423 was incorporated, a single Mk.I or Mk.II 4,000lb HC "Cookie" bomb could be slung centrally in the bomb-bay. A variety of small calibre bombs (8.5lb, 11.5lb or 20lb) could also be loaded for practice training, using special adaptors. These bombs were installed either in pairs in the centre cell (Mk.I) or independently in each cell (Mk.II and later versions). For bomb sighting a Mk.II or Mk.IXA Course Setting Bombsight was fitted on early aircraft, while on the Mk.X a Mk.XIV or American type T.I bombsight was provided.

Coastal Command aircraft, in addition to their bomber role, fulfilled another offensive task against ships and U-boats. The bomb-bays of a number of Mk.IC, III and Xs were modified to carry one or two 1,610lb 18" Mk.XII torpedoes, with the two pieces installed either side by side or vertically one above the other.

The bomb compartment was also suitable for carrying long-range fuel tanks. Initially only two 140-gal tanks were carried in the outer bomb bays of Mk.I aircraft, while in addition or in their place subsequent versions used a single 185-gal tank in the centre cell. Each of these three variants could also be used in combination with additional fuselage tanks (two 110-gal reservoirs or one 43 – 60-gal tank in place of the rest bunk). The range of Mk.III and X aircraft was extended even further by the implementation of a 295-gal overload tank fitted in place of the 4,000lb bomb.

Wellingtons used for training in heavy load take-off had provision for water ballast installation, of which two types were utilised: water was stored either in three 250lb containers attached to the upper tier of the bomb-bay centre cell or in two 140-gal overload fuel tanks in the outer cells; the latter instalment had a jettison system.

Defensive armament was initially concentrated in the front and rear gun stations. Mk.I aircraft were equipped with Vickers-designed gun turrets, with one 0.303" (7.7mm) Browning gun in the nose and two in the tail. The gunsight was a Mk.III Free Gun Reflector Sight. The field of fire was limited to a traverse angle of 190°, with 42° of elevation and 30° of depression. The ammunition for the nose gun was 1,200 rounds, carried in four boxes on the turret floor, and 2,000 rounds for each of the stern guns, which were stowed in 12 boxes near the turret and amidships on the fuselage floor. For lower hemisphere defence a retractable ventral turret was considered; the proposed FN9 turret did not reach production and was succeeded by an FN25 type on a limited number of Wellington Mk.IA and ICs. It mounted two Browning MGs, with 360° of rotation, 5° of elevation and 80° of depression. Nash & Thompson front and rear turrets were introduced from the Mk.IA onwards – they were completely mobile so improved the flexibility of the guns. Twin Brownings and Mk.IIIA gunsights were employed in the FN5A turrets that were used at both bow and stern stations. Each gun was fed with 1,000 rounds of ammunition contained in boxes on the floor, while a total of 2,000 rounds were held in reserve below the navigator's table and near the rear turret. The turret movement limitations were: traverse 190°, elevation 60° and depression 45°. An FN10 turret was planned next for the stern station, but armament unification prevailed and the FN5A became a standard front and tail turret for Mks.IA, IC, II and IV aircraft. During production of the Mk.IA and IC, the traverse of the front turret was extended further still by including a cut-out behind the turret, enabling it to rotate up to 110° on each side. With the dispensation of the ventral turret, beam gun stations were installed on some Mk.IA and IC aircraft in their cabin windows or immediately above them. A 0.303" Vickers 'Class E' or Browning gun was used. During Mk.IC and Mk.II production a trapezoid window on each side of the rear fuselage was implemented, although some early Mk.IIs also had the former 'mid guns' installed. In the new beam positions two Browning guns were pivoted in a mounting frame with ranges of movement of 30° in elevation, 45° in depression and 30° both fore and aft in traverse. Each gun was supplied with 600 rounds of belt ammunition from a box below the window.

Rear defence was improved on Mk.III aircraft by the introduction of an FN4A turret (early aircraft only) or a type FN20A, with four Brownings. In later Mk.III and X aeroplanes a strengthened FN120 rear gun turret may have been fitted, or, in the case of the Mk.X, a type FN121. Usually a Mk.III or Mk.IIIA reflector gunsight was used and the field of fire remained unchanged. The FN4A ammunition and its feed was identical to that of the FN5A, while type FN20, 120 and 121 turrets had a servo feed through ducts along the fuselage sides and through the base of the turret; 2,000 rpg supply was carried. Mk.IV aircraft were equipped with FN5A turrets too, although the tail unit was replaced by the FN20A on some machines. On T Mk.10s the rear turret was fitted but completely immobilised, with ammunition tanks, servos and piping removed.

Wireless equipment consisted of a Marconi GP transmitter and receiver, and an amplifier or transceiver was provided for intercommunication purposes. Mks.I, IA, IC, II and some early Mk.IVs utilised a GP R.1082 and T.1083 set, while from the Mk.III this installation was changed to a T.1154 and R.1155. An intercommunication Type B amplifier was used in Mk.Is, which was substituted by an A.1134 in later versions. A TR.9F R/T unit was installed beginning from the Mk.II, or TR.9H in some Mk.III/X aircraft. In Mk.Xs a TR.1196 wireless set could also be fitted instead. The GP wireless installation employed either a fixed or trailing aerial – the former was slung either between two masts (Mk.I) or between the mast and the fin (other Marks), while the latter was lowered through a tube in the fuselage port side amidships. The aerial for the TR.9 suspended from the fixed aerial and fed into the port side of the fuselage, whereas that of the TR.1196 led directly from the fin to the fuselage top.

A D/F loop aerial (Ariel Tuning Unit Type 126) was used in conjunction with the GP wireless set (not fitted to all early Mk.Is) and was mounted on the top of the fuselage; from the Mk.IA it was enclosed in a streamlined container.

A Lorenz Blind Approach device was introduced during Mk.IC production and employed two receivers – the R.1124A and R.1125A. The former was connected to an aerial housed inside the fixed mast or to a retractable rod antenna (some Mk.III, IV and Xs), while the latter operated a di-pole antenna, Type I, mounted beneath the centre of the rear fuselage. In addition, the TR.9 unit was also used for beam-approach signals. On post-war Mk.10 trainers the Standard Beam Approach installation was in the form of an ARI.5386 Tuneable BA, consisting of R.1125D and R.1466 units and associated rod aerials.

IFF equipment (the ARI.5000) was first incorporated in Mk.II aircraft. Its R.3003 set used two aerials leading from the fuselage sides to the tailplane tips. On later Mk.Xs the receiver was replaced by an R.3061 or R.3090 unit; the latter was a new IFF Mk.3 (the ARI.5026) installation, which also included a Type 90 sword aerial below the fuselage. Wellington Mk.Xs carried, in addition, other radio equipment: an ARI.5002 (a whip aerial on top of the fuselage), an ARI.5022 (a T.3135/R.3136 set and a dart-like antenna below the rear turret) and an ARI.5033 (the R.1335, alias Gee Mk.I, with a whip aerial above the navigator's compartment). The Gee navigational device was retrospectively fitted to some Mk.III aircraft and could be replaced by a Gee Mk.2 (the ARI.5083) on later Mk.Xs.

Cartridge-type cable cutters were fitted into the leading edge of the inner and outer main plane (from Mk.II aircraft), whilst the de-icing system, consisting of inflatable tubes, was installed on the leading edges of the fin and tailplane. The windscreen de-icing system was provided on aircraft fitted with the windscreen wipers. Some Mk.III and X aircraft could be modified for glider towing by the installation of towing gear at the rear fuselage terminal ring, while others could be fitted with Airborne Forces Equipment, consisting of a platform with doors over the hole in the bottom of the fuselage. Ten paratroopers were seated beside the hatch and their four equipment containers, weighing 350 lb each, were carried in the bomb-bay instead of the bombs.

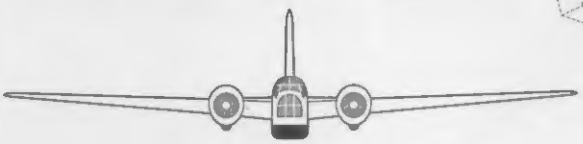
Wellington T Mk.10s were equipped with additional navigational equipment, such as the Rebecca Mk.4, recognisable by Yagi antennae below the cockpit and rod aerials below the fuselage. Other equipment comprised twin TR.1143 VHF radio sets, improved IFF Mk.3GR (R.3121), special TRE adjunct for navigators (R.3624) and two R.1355 multi-frequency receivers, an ADRIS position indicator, a DR radio compass and a T.1 bombsight.

The spacious fuselage of the Wellington enabled a wide range of reconnaissance, emergency and other equipment to be carried. An F.24 type camera, for both day and night photography, was mounted either in the nose or in the rear fuselage. For night missions a photo-cell was used for target identification and bomb burst recording. F.97 cameras were employed to record enemy troop movements, with the ground being illuminated by flash cartridges. When torpedoes were carried, an F.46 camera was used for documentation. Six 4.5" or 5.5" reconnaissance flares and another six Flame Float Mk.IIs or Sea Marker Mk.IIIs were carried and launched using a tube on the starboard side of the fuselage. In certain Mk.III and X aircraft multiple flare chutes were installed in the circular hatch in the bottom of the fuselage, comprising six cells in two groups (early a/c), three cells (Mk.X) or two cells (T Mk.10). T Mk.10 only carried 2 flares and 9 flame floats. Two forced-landing flares were housed in the port inner main plane (not fitted to later Mk.III and Mk.X a/c), while a Very signal pistol was positioned in the roof of the wireless compartment. Emergency equipment included 6 parachutes, 'Mae West' life saving jackets, fire extinguishers, first-aid kits and a fireman's axe. An inflatable Type J rubber dinghy was carried in the starboard engine nacelle and was released automatically on water impact, or manually by pulling handles on the fuselage. Additional ASR equipment (e.g. paddles, a 12-foot lanyard, a T.1333 transmitter and generator, sea markers, emergency rations) were stored in Type 5 and Type 7 packs, either in the nacelle container or in the fuselage. Flotation gear was also installed, consisting of 14 inflatable bags at the top of the bomb cells. Other equipment comprised oxygen apparatus, a cabin heating and ventilation system, a visual signalling system, navigational aids, a pilot's anti-dazzle screen, cockpit roof sun-blinds, a collapsible fabric hood and screens (for instrument flying), fuselage window curtains (early Mk.III a/c), a rest bunk, sanitary equipment, flying controls locking gear, an engine-starting handle and a wooden entrance ladder. ■

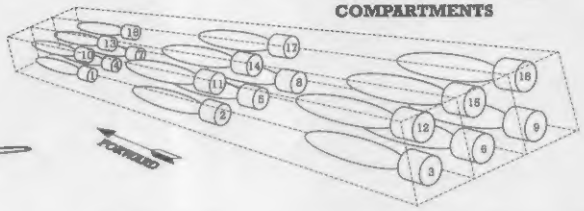
Bombs dropped operationally by Wellingtons (Bomber Command, 1939 – 1943)

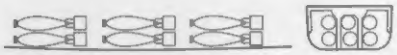
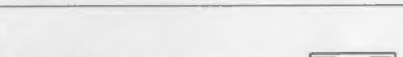
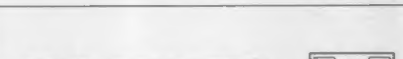
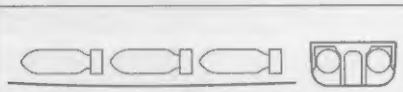
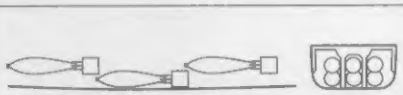
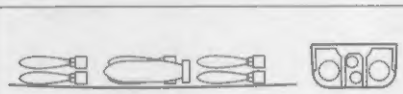
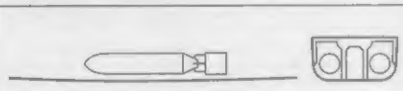
Calibre/type	Qty dropped	Tonnage (lb)	Period	Note
4,000lb HC	1,927	7,708,000	1941 – 43	High Capacity bomb
4,000lb MC	1	4,000	1943	Medium Capacity bomb
4,000lb GP	3	12,000	1943	General Purpose bomb
2,000lb HC	3	6,000	1941 – 42	High Capacity bomb
2,000lb AP	235	470,000	1941	Armour-Piercing bomb
1,900lb GP	30	57,000	1942 – 43	General Purpose bomb
1,000lb GP	6,352	6,352,000	1940 – 43	General Purpose bomb
1,000lb RDX	54	54,000	1942	explosive bomb
500lb MC	1,264	642,000	1943	Medium Capacity bomb
500lb LD	3	1,500	1943	Light Duty bomb with delayed fusing
500lb GP	67,745	33,872,500	1939 – 43	General Purpose bomb
500lb SAP	7,413	3,706,500	1939 – 42	Semi-Armour-Piercing bomb
250lb GP	48,544	12,136,000	1940 – 43	General Purpose bomb
250lb SAP	1,027	256,750	1941 – 42	Semi-Armour-Piercing bomb
40lb GP	760	30,400	1940, 1942	General Purpose bomb
250lb Inc	1,091	272,750	1940, 1942 – 43	Incendiary bomb
50lb Inc	3,947	197,350	1941	Incendiary bomb
25lb Inc	16,824	420,600	1940 – 42	Incendiary bomb
30lb Inc	144,297	4,328,910	1941 – 43	Incendiary bomb
4lb Inc	5,710,135	22,840,540	1940 – 43	Incendiary bomb
4lb mixed	82,617	330,468	1943	mixed explosive and incendiary charges
TOTAL	6,094,292	93,899,268		

LOADING DIAGRAM



NUMBERING OF BOMB COMPARTMENTS



	17 or 18 x 250lb AS bomb (compartment Nos. 1 - 8, 10 - 18)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		10 x 250lb AS or LC bomb (compartment Nos. 4 - 6, 11 -15, 17, 18), 2 x 250lb SBC (comp. Nos. 10, 16)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X
	17 or [illegible] x 250lb LC bomb (compartment Nos. 1 - [illegible] 10 - 18)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		6 x 250lb AS or LC bomb (compartment Nos. 4 - 6, 13 - 15), 6 x 250lb SBC (compartment 10 - 12, 16 - 18)	Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X
	6 x 250lb B bomb (compartment Nos. 10, 11, 12, 16, 17, 18)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		9 x 11.6lb practice bomb (compartment Nos. 1 - 9)	Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X
	9 x 500lb GP or SAP bomb (compartment Nos. 2, 5, 8, 10, 13, 16, 12, 15, 18)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		2 x 18 inch Mk.XII torpedo (bomb carrier beam)	Mk.IC
	2 x 1000lb GP bomb (bomb carrier beam), 8 x 250lb SAP bomb (compartment Nos. 4 - [illegible] 13 - 15)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		6 x depth charge (compartment Nos. 10 - 12, [illegible] - 18)	Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X
	2 x 2000lb AP bomb (bomb carrier beam)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		3 x depth charge (compartment Nos. 10 - 12), 1 x 140-gal fuel tank	Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X
	1 x 4000lb HC bomb (Modification 423)	Mk.IC Mk.II Mk.III Mk.IV Mk.X		1 x 185-gal fuel tank	Mk.III (late) Mk.X
	4 x 250lb SBC (comp. 10, 11, 16, 17) [illegible] x 250lb SBC (compartment Nos. 10 - 12, 16 - 18)	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X		2 x 140-gal fuel tank	Mk.I Mk.IA Mk.IC Mk.II Mk.III Mk.IV Mk.X

A 2,000lb Armour-Piercing bomb ready for loading into a Mk.IC of Mildenhall-based No.149 Squadron. Just in 1941 more than 230 of these bombs were dropped by Bomber Command Wellingtons.


KA
KA
KA